THE
ELECTRICAL REVIEW

Volume CXXVI. No. 3259

Friday, May 10th, 1940

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Committee. Accepted. Electric passenger lift at the Mile End Hospital (£910).—Evans Lifts. Repairs to fuel economiser at the Park Hospital, Hither Green (£758).—Clay Cross Co. Cold storage plant at the Southern Hospital, Dartford (£521).—Kelvinator, Ltd.

Manchester. — Electricity Committee. Recommended. Fibre cable conduits.—Key Engineering Co. 33-W cable.—W. T. Glover & Co. 11-kV cable.—Scottish Cables. One 40,000 kVA three-phase transformer and modifications to two existing 25,000-kVA transformers.—Met.-Vick. Electrical Co. (Revised tender). Spare parts for mechanical stokers at Barton power station.—International Combustion.

Salford.—Electricity Committee. Recommended. Rectifier equipment (£230).—Hewittic Electric Co.

Stoke-on-Trent.—Assistance Committee. Accepted. Cable renewal at London Road Institution (£320).—Callender's.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Alloa.—Houses at Whins Road, Moir Street, and Bowhouse (£30,000), for T.C.; burgh surveyor.

Barking.—Factory additions; Isonzo Candy Co., River Road.

Factory additions; A. Ibbetson & Co., River Road.

Bathavon.—Houses (50), Batheaston, for R.D.C.; surveyor, 10, Green Park, Bath.

Birmingham.—Methodist Church in Lyndon Road, Sheldon; T. Wooton, builders, Chester Road, Coleshill.

Bristol.—Senior school on a site at Bedminster Down; city architect.

Burton-on-Trent. — Hotel in Short Street, Stapenhill, for Marston, Thompson & Evershed, Ltd., The Brewery, Shobnall Road, Burton-on-Trent.

Canley.—Sunday schools and church; Rev. F. Guy Morris, chairman, Methodist Conference Committee.

Cardiff.—Works premises and offices, Newport Road, for Connies & Meaden, Ltd., Plymouth Works, Dumballs Road.

Chatham. — Temporary isolation accommodation at County Hospital, for Kent P.A.C.; county architect, Springfield, Maidstone.

Clitheroe.—Extensions to mill; R. D. Blackburn & Sons, Little Moor.

Coventry.—Block of shops in Fleet Street; Bridge, Walker, Ltd., builders, Brixton, S.W.2.

Shops and showrooms, Fleet Street, for Coventry Business Estates, Ltd., 219, Farleigh Road, Warlingham, Croydon, Surrey; Hillier Parker May & Rowden, 27, Maddox Street, London, W.1.

Church at Coundon and extensions to Sunday schools at Lime Tree Park; Methodist Union Committee, Central Circuit.

Houses (19), Benson Road, for R. R. Button, Addison Road, Keresley.

Dagenham.—Factory in Selinas Lane; W. A. Smith & Co., Boleyn Castle, East Ham, E.13.

Devonshire.—Police stations, Torquay and Totnes, for Standing Joint Committee; H. V. de Courcy Hague, county architect, 97, Heavitree Road, Exeter.

Downham Market. — Alterations to pumphouse, and foundations for new drainage plant, Fordham Fen, for Stoke Ferry Drainage Commissioners; O. Borer, engineer, Brooklands Avenue, Cambridge.

Durham.—Nurses' home and medical superintendent's house at School Aycliffe Mental Colony for the C.C.; Rees and Holt, architects, 64, Rodney Street, Liverpool.

Additions to P.A.C. offices for the C.C. (£2,000); W. J. Merrett, county surveyor, 43, Old Elvet, Durham.

Ealing. — Church, Horsenden Lane North, for Parochial Church Council; C. A. Farey, architect, Prince Albert Road, Regent's Park, N.W.8.

Extensions to factory for Supak Manufacturing Co., Aintree Road; Worboys & Sons, contractors, 4, London Road, Wembley.

Eire.—CORK.—Houses (210), Greenmount, for T.C.; J. R. Boyd Barrett, architect, 61, South Mall, Cork.

Block of shops, &c., Gurranabraher; J. R. Boyd Barrett.

LIMERICK.—Regional hospital scheme, for T.C.; P. J. Sheahan, architect.

LOUTH.—Works at Ardee Mental Hospital (£30,000); J. F. McGahon, architect, 9 and 18, Exchange Buildings, Dundalk.

Edinburgh.—Offices and showrooms (£60,000), Lothian House, Toll Cross, for Town and Country Estates, Ltd.; Stewart, Kaye and Walls, architects, 14, Hill Street.

Erpingham. — Houses at Sustead, Northrepps and Southrepps, for R.D.C.; surveyor, Council Offices, St. Peters Road, Sheringham.

Evesham.—Waterworks (£17,000); borough engineer.

Fenton (STAFFS).—Factory additions, Victoria Road; T. Byatt, Ltd.

Foleshill.—Chapel in Lockhurst Lane; Methodist Union trustees

Glasgow.—Additions to works, Cogan Street; G. Cohen, Sons, & Co., Ltd.

Gloucestershire.—Engineering block at "The Woodlands," Cheltenham, for the County Education Committee; Ashley & Winton, architects, 14, Gray's Inn Square, London, W.C.1.

Guildford.—Factory additions, By-Pass Road, for the Warner Engineering Co.; Leslie Hiscock, architect, Maori Road, Guildford.

Hinckley.—Male ward (£8,000), Hinckley and District Hospital; Pick, Everard, Keay and Gimson, architects, Leicester.

Hucknall.—Fire station, Derbyshire Lane, for U.D.C.; H. M. Aitchison, surveyor, Council Offices.

Huntingdonshire. — Police station (£6,500), Fletton, for Hunts Standing Joint Committee; T. H. Longstaff, county architect, Walden House, Huntingdon.

Isle of Wight.—New boiler house and other works, Whippingham School, for E.C.; S. Gregson, county architect, County Hall, Newport.

Jarrow-on-Tyne.—Houses, Low Simonside estate; J. S. Weir, borough engineer.

Kingsclere and Whitchurch.—Houses (20), Ashmansworth, Ecchinswell, and Headley; Clerk's Office, Swan Street, Kingsclere.

Kirkham (LANCS). — Sewage works (£26,621); U.D.C. surveyor.

Kirriemuir.—Houses, Middlefield and Knowehead; burgh surveyor, Town Hall.

Leicester. — Accommodation at City General Hospital for 600 patients, together with staff quarters, kitchens, &c.; city architect.

Lincoln.—Extensions, including operating unit, X-ray and out-patient departments, at Lincoln County Hospital (£40,000); secretary.

London.—SOUTHFIELDS. — Factory extensions, 310, Merton Road, S.W.18, for Simmonds & Stokes, Ltd.; J. Rider Hunt & Co., architects, 181, Queen Victoria Street, E.C.4.

Macclesfield.—Development of Collar House estate, Poynton; Cordingley and McIntyre, architects, 195, Oxford Road, Manchester.

Manchester.—Accommodation, Baguley sanatorium; city architect.

Sewage works; city engineer, Town Hall, Manchester, 2.

Rehousing schemes (£168,000); city architect.

Factory for C. H. Johnson & Son, Smedley Lane, Cheetham; J. H. Sellers, architect, 78, King Street.

Melford.—Flax factory, Glemsford station; A. E. Wiseman, architect, Chelmsford.

Mexborough.—Alterations to kitchens and dining rooms at Montague Hospital, Adwick Road; D. W. Harrop, architect, 31, Bank Street.

Middlesbrough.—Inquiry for site for paint factory received by Tees Development Board, North-Eastern Bank Chambers.

Newcastle-on-Tyne.—Alterations at the Phœnix mills; J. O. C. Solomon, city property surveyor, Town Hall.

Newquay. — Pavilion, East Street; U.D.C. surveyor.

Northern Ireland.—BELFAST. — Textile factory, Donegall Street, for Bradford Dyers' Association, Ltd., Well Street, Bradford.

ARMAGH.—Large canning factory, for Wisbech Produce Canners, Ltd., London; C. W. Smedley, managing director.

North Kesteven.—Houses for agricultural workers; surveyor, Council Offices, Clasket Gate, Lincoln.

Northwich.—School; W. Forster & Son, contractors, Moss Road, Castle, Northwich.

Norwich.—Workshop block, technical college (£31,994); borough surveyor.

Nottinghamshire.—Administrative and clinical blocks and staff accommodation, Ransom Sanatorium (£49,000), and hostel and cottages in form of village settlement; E. W. Roberts, county architect, Nottingham.

Peterborough.—Additional pumping station, Etton waterworks, Glinton, for the T.C.; Jennings Builders, Ltd., contractors, Walpole Street, Westwood Bridge, Peterborough.

Plymouth. — Social centre, bathing station, &c. (£37,000); borough engineer.

Rowley Regis.—Fire station buildings on site at Old Hill; Surveyor, Council House.

Sheffield.—Church, Barnsley Road, for Rev. R. Roseveare, The Priory, Parson's Estate; W. G. Robson, Ltd., Bamforth Street, Owlerton, Sheffield, 6.

School buildings at Meynell Road, Fox Hill and Lindsay Road; W. George Davies, city architect, Town Hall.

Southwell. — Houses (£10,926), for R.D.C.; clerk, 8, Westgate, Southwell, Notts.

Staffordshire.—Proposed new technical college for Brierley Hill and Stourbridge; K. L. Murray, county architect, County Buildings, Stafford.

Stoke-on-Trent.—Houses for Owen & Co., Station Green, Milton.

Additions to Carlton Works, Copeland Street, for Wiltshaw & Robinson, Ltd.; Sambrook Bros., Ltd., contractors, Hamil Road, Burslem.

Buildings at North Staffordshire Royal Infirmary, Princes Road, Harthill; Stephen Heath & Son, contractors, Brunswick Street, Newcastle-under-Lyme.

Sutton and Cheam. — Central fire station; borough engineer, Municipal Offices, High Street, Sutton.

Swansea.—Grammar school, Sketty; borough engineer.

Tottenham. — Factory, Farningham Road; Radiamp Co., Ltd.

Factory reconstruction, Ferry Lane; A. & W. Flatau & Co., Ltd.

Factory extensions, Lawrence Road; Cronite Foundry Co., Ltd.

West Lancashire.—Fire station, Old Racecourse Road, Maghull, and houses for farm workers in rural districts; R. Rosbotham, surveyor, West Lancashire R.D.C., 52, Derby Street, Ormskirk.

Wiltshire.—Extensions and alterations (£11,709), Calne Senior School, for E.C.; county architect, County Offices, Trowbridge.

Wokingham.—Pumping stations and sewage disposal works, for R.D.C.; Howard Humphreys & Sons, engineers, 17, Victoria Street, Westminster, S.W.1.

Wolverhampton.—Additions, Alustar works, Marston Road, for Star Aluminium Co., Ltd.

COMING EVENTS

May 7th (Tuesday).

Illuminating Engineering Society.—St. Ermin's Hotel, Westminster. 1 p.m. Informal luncheon. Lighting Service Bureau, London, W.C.2. 5.30 for 6 p.m. Annual general meeting.

May 8th (Wednesday).

I.E.E. (Transmission Section).—Institution, London, W.C.2. 6 p.m. "Mechanical Integrity in the Design of Electrical Circuit-Breakers." By M. C. Hunter.

May 9th (Thursday).

I.E.E.—Institution, London, W.C.2. 6 p.m. Annual general meeting.

Association of Mining Electrical Engineers (South Wales Branch).—Annual general meeting. Visit in the afternoon to the G.E.C. new showrooms in Kingsway, Cardiff.

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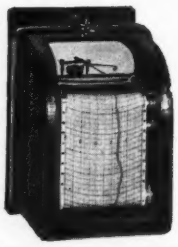

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THE
ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXXVI. No. 3259 MAY 10, 1940 Price SIXPENCE

Is Electricity Unpatriotic ?

Gas Advertisement Implications

IT used to be an axiom that a valid contract or agreement should be of advantage to both parties to it. We have read and re-read, analysed, and subjected to the microscope the memorandum of the Joint Gas & Electricity Committee which adumbrates the terms of the "truce" between the two industries and still we cannot discover anything in it likely to benefit the electrical industry. On the contrary, if it means anything at all, it is an agreement by the representatives of the electricity supply authorities to sit back for the duration of the war in the hope that the gains of the past twenty years will be "consolidated" and that an occasional new member of the public may ask for a supply.

Healthy Competition

Let us bear clearly in mind that a very large proportion of those gains were at the expense of the gas industry and were only obtained by hard striving. While it may be hoped that the merits of electricity will prevent any falling-away of consumers, only the blindest optimist will think that this by itself will hold the industry together and that there will be no retrogression.

For many years the gas people have maintained that there should be a "national fuel policy"—a proposal which would naturally occur to those who saw a serious rival forging ahead. Such a policy may look attractive but we are convinced that the public has obtained more satisfactory and cheaper gas and electricity services through the competition of the two industries than "co-ordination" would have given, and the industries themselves have advanced more rapidly as a result.

But is it right that this rivalry should continue during the war? This is a delicate problem and one which the gas industry is treating in a peculiar fashion. Having endeavoured to muzzle electricity and stifle development by the specious suggestion that only "new" business should be taken on by either party, it proceeds to play on a patriotic note in its approach to the public, thus manœuvring its rivals into a false position. It has arranged that there shall be no disparaging statements made in advertising or canvassing and nobly observes the letter of that agreement. But when it tells the public that gas is helping to win the war because the more gas used the greater the quantity of by-products available for explosives it does more harm to the electrical industry than mere disparagement. A recent advertisement says: "Make the utmost use of gas for hot water. It's automatic—and it's patriotic too." By implication electricity is a tool of the "fifth column" and those who advocate its use are doing the country a disservice.

This, of course, is a gross distortion of the facts. Nobody will deny the value of the by-products of the gasworks, but if those by-products are as important as we are led to believe, it should be worth while to give the gas away. Consumers of gas may well ask why the price has gone up. However that may be, electricity has its attributes too. The gas industry claims that it saves the uneconomic widespread distribution of coal. Electricity goes even further than this by confining the transport of coal to fewer points. Moreover, generating stations can use classes of coal that are very little good for anything else, which releases coal for export. Then there is the question of continuity and security of supply. The gas industry has nothing to set beside the grid, which ensures that whatever happens in any locality there will be means of maintaining electrical service. The risks of fire are far less serious than is the case with gas.

Publicity Expenditure

It is very evident from the spate of gas advertising in the daily and weekly newspapers that our rivals have a good deal more money to spend than has electricity. While E.D.A.'s income is sadly diminishing, the British Commercial Gas Association has, if anything, intensified its activity since the war began. We cannot blame the gas industry for doing its best for itself. Rather we would chide the electricity supply authorities, first, for allowing themselves to be told by the gas industry what they should or should not do, and, secondly, for starving their propaganda organisation when it is obvious that the gas people have no intention of abating their development efforts.

As we have said before, this is not purely a "supply" matter. The manufacturers and sellers of all kinds of electrical equipment—domestic and commercial—and installation contractors are very deeply concerned that the volume of work should not fall away. Among other evil results, the

destruction of the home market would largely cut away the basis on which British electrical export trade is founded. For saying all this we shall no doubt be beaten with the "patriotic" stick. Nevertheless, we are determined not to remain silent while a substantial part of the electrical industry is in danger of disintegration. We hold that a virile electrical industry is an essential national structure—in war as well as in peace.

Maintaining Supply

WITHIN the past few days we have had an opportunity of inspecting a sample emergency outdoor substation that has been built up from the spare parts stored by the Central Electricity Board at dumps in various convenient spots throughout the country. To be able to put into service a substation of large output within a day (working hours) of the assumed destruction of generating plant or of a bulk supply point, instead of the many months that would normally be required, is a feat of co-ordinated effort that should be a most important factor in minimising any curtailment of electricity supply due to enemy action. Procedure in case of emergency is simple, and while many details cannot be published, for obvious reasons, it may be said that the ready co-operation of manufacturers of all the many plant items has been a big factor in making the arrangements effective. While the scheme has been devised to meet war conditions, there seems no valid reason why it should not remain a permanent feature of electricity supply practice.

Insulation Research

FEW subjects illustrate so well the importance of physics and chemistry in electrical engineering as do methods of insulating conductors, and probably none makes so good a case for the commercial value of research. Both aspects were clearly brought out in Mr. H. Warren's lecture last Friday to the I.E.E. Meter and Instrument Section, more particularly in his reference to the remarkable progress made in continuing the line of investigation into the electrical properties of synthetic resins initiated by Baekeland in 1908. In this connection great interest is attached to the minimising of tracking. Apart from improvements in quality, such as this, the trend in dielectric development has been consistently in the direction of reducing space factor and production time.

Alms and the Man

As many readers know, Mr. George Bernard Shaw was employed in the telephone industry as a young man, and one of his associates in those days was Mr. Justus Eck, hon. secretary of the Electrical Industries Benevolent Association. Recently Mr. Eck wrote and reminded Mr. Shaw of his early connection with the electrical industry and hinted that a donation to the E.I.B.A. funds would be an appropriate way of commemorating it. "G.B.S." replied, "Nothing doing! The Royal Literary Fund is my shop." It is pointed out that in spite of this, as a past member of the industry, Mr. Shaw is still eligible for help in case of need—and you never can tell.

Trade with Australia

MORE than usual interest lies in the latest report of the Australian Association of British Manufacturers in view of the wartime difficulties which it is having to meet. The Association is able to state that, after the inevitable initial dislocation, the position with regard to the continuity of supplies of most commodities exported from the United Kingdom to Australia has proved, on the whole, considerably better than was anticipated. There are, however, notable exceptions where the shortage of raw materials has curtailed or cut off supplies. The British Government's determination to encourage exports as a means of paying for the war is welcomed by the Association. Reference is made to the Australian restriction of imports from non-British countries. This will result in increased purchases from British and Australian manufacturers and conserve the Empire's non-sterling exchange resources.

Increasing Working Space

IN one area in the centre of Manchester containing over 1,100 premises, mainly commercial, some 2,250 electric fires or heaters are installed. The National Smoke Abatement Society states that approximately half of these take the place of open coal fires, while the other half provide additional sources of heat. In the latter case British coal is burned through the agency of electricity to bring into gainful occupation much serviceable room space, thus enhancing the value of property in city areas. As to the proportion substituted for coal fires, about the same tonnage of coal (though of poorer quality) is consumed in generating the electricity required, but transport for local distribution in congested areas is saved and pollution of the atmosphere is avoided.

Drawing-Office Lighting

A LARGE engineering concern in Illinois has adopted methods of securing an efficient system of illumination for a new drawing office that many would consider unorthodox. According to the *Electrical World*, a hung plastered ceiling 11 ft. 9 in. from the floor, is broken up by parallel barriers, 11 ft. 6 in. apart and 1 ft. 9 in. deep. An average intensity of 36 ft.-candles is obtained from 500-W lamps in silvered bowl reflectors at 9-ft. centres. Ceilings are painted "off-white" with a reflection factor of 85 per cent. and the walls are buff with a reflection factor of 65 per cent. The justification for this departure from the usually accepted practice of having a continuous ceiling free of beams and other obstructions is said to be a shadowless system that entirely avoids glare, much of which comes from distant points at low angles of vision. Moreover, by making the barriers thicker than is necessary for the lighting scheme, an appreciable saving in bulding costs has been effected.

Vehicle Registrations

THE returns of electrically propelled road vehicles registered in March showed only one electric vehicle. This, on the face of things, seems a poor result from the campaign which the Electric Vehicle Association has been vigorously conducting. But, as Mr. A. C. Cramb, writing as secretary of the Association, pointed out in a letter to *The Times* this week, the returns relate only to private cars. He claimed that since the commencement of the war the 5,000 electric vehicles already in use have been augmented by a further thousand for such purposes as milk delivery, bakery rounds, dairies, coal haulage and municipal dust collection.

X-Raying Poles

A METHOD of inspecting wood poles by means of X-rays has been put into service on the system of the Detroit Edison Co. The rays, which, after penetrating the wood, fall on a film that records the shadows, are furnished by a portable medical unit. According to the *Electrical World*, this equipment gives more accurate results than can be obtained by boring, and also enables the future life of the pole to be computed through providing a permanent record of the progress of rot. A relatively high cost is said to be justified by the saving in replacements, as poles are often needlessly condemned from the evidence of boring. There are some pitfalls to be guarded against. One is that wet rot is apt to absorb more X-rays than good wood, and so the poles thus affected may appear sounder. This difficulty has been got over by placing more reliance on a study of the fibre structure, which gives easily recognisable symptoms of decay, than on film density. Other special problems await solution, but the application of the procedure to conditions in this country should be well worth looking into.

PAPER MILL CONVERSION

Steam Replaced by Power Company's Supply

THE recent replacement of two steam engines by electric motors in the paper mill of Cromptons (Stubbins), Ltd., at Stubbins, Lancs, completes its conversion to electric drive. When the mill came into being in 1912 as an auxiliary of James R. Crompton & Bros., Ltd., Bury, the preparation machinery was driven by a cross-compound steam engine which also operated a 75-kW DC generator for lighting, while a small high-speed engine drove the one paper machine which was found to be sufficient for the requirements of the company at that time.

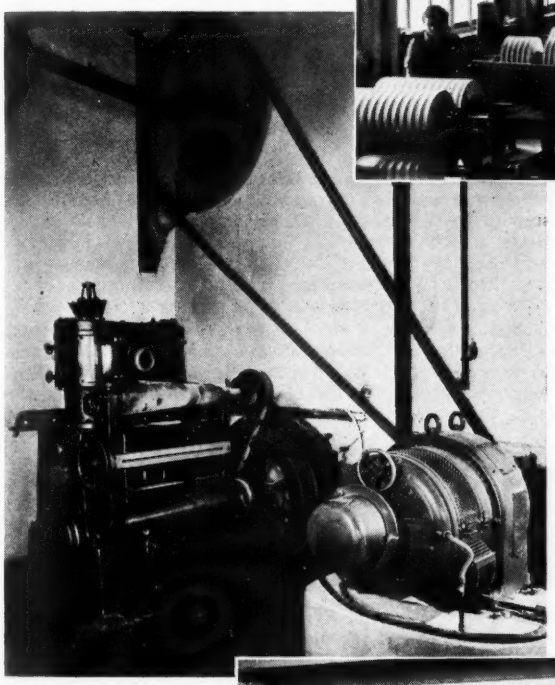
Even in those early days a small supply was taken from the Lancashire Electric Power Co., and this steadily increased as additional machinery, comprising two more paper machines, had to be installed to keep pace with the growing demand. Initially one of these machines was driven by a 40-HP B.T.H. 3-phase commutator variable-speed motor, and the other by a DC variable-speed motor off the mill's own supply; later they were operated from the AC supply.

This policy of cautious electrification adopted by Mr. R. Crompton, the managing director, enabled a searching study to be made of the new and old forms of drive as they affected the output and quality of paper and cost of production. Incidentally, only by taking a supply from a public undertaking can such a process of gradual electrification be a practical and economic proposition. The data accumulated was carefully studied, and early in 1939, after considering the case for private generation and the familiar "process steam" argument against electric power, the verdict was in favour of sectionalised electric drive, taking a supply from the Lancashire Electric Power Co.

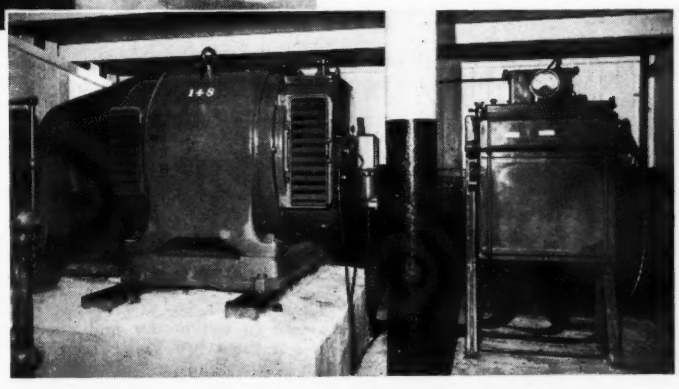
There then remained for conversion the two steam engines already referred to—the cross-compound plant driving most of the beaters and the small high-speed engine operating the No. 1 paper machine. It was decided to split up the beaters into groups driven by four 250-HP Crompton Parkinson motors and thus be able to vary the flow of raw and prepared material to the three paper machines as required. The No. 1 machine was to be driven by a 40-HP variable-speed B.T.H. commutator motor.

The layout of the mill is planned to utilise gravity and so avoid all unnecessary lifting. The raw material (flax and hemp) is sorted on a conveyor, dropped into a hopper, and blown by an electrically driven Sturtevant fan into a cyclone situated above the rag boiler filling floor. Then it is dropped on to a further conveyor and discharged directly into box trucks, which are automatically weighed. From here it is fed direct into the rag boilers carried on steel trestles above the level of the washing and bleaching engines, where it is boiled with alkali. After this the material is lowered in successive stages, at which it is subjected to bleaching, breaking, draining, beating, purifying, and straining processes, until ultimately the refined material flows on to the paper machine wire.

The salle, showing the cutting machines and the paper being reeled ready for despatch to cigarette factories



Variable speed AC commutator motor, replacing the high-speed steam engine shown in the background, for driving paper machine



A 250-H.P. motor driving a battery of beating engines

Before leaving the machine wire a water mark is impressed on the material, which at this stage is like wet blotting paper. The moisture is then extracted by means of suction, and after being passed through presses and over steam-heated drying cylinders the finished paper emerges and is run on to rolls ready for cutting.

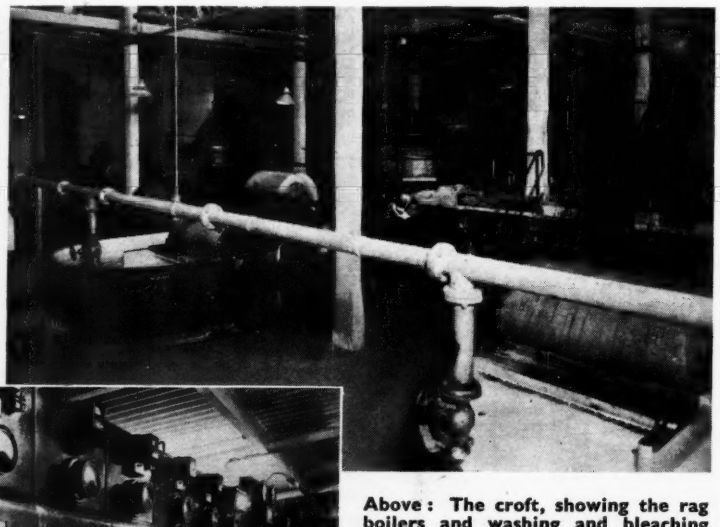
All the preparation processes described need to proceed at a pace that will ensure an even flow of material to the three paper machines. The sectionalisation of the electric drive facilitates this, as each separate battery of beaters can be run to meet the specific requirements of the paper machine which it feeds. If the steam engine which drove the beaters had broken down, many beaters would have been idle, but under the new conditions, if one electric motor failed, the other motors would keep their respective batteries going. Moreover, in addition to the normal supply of electricity through the power company's substation at Stubbins, there is an alternative route from its Radcliffe feeder, and yet further guarantees against stoppage of the works are two other sources of supply which could be tapped at short notice.

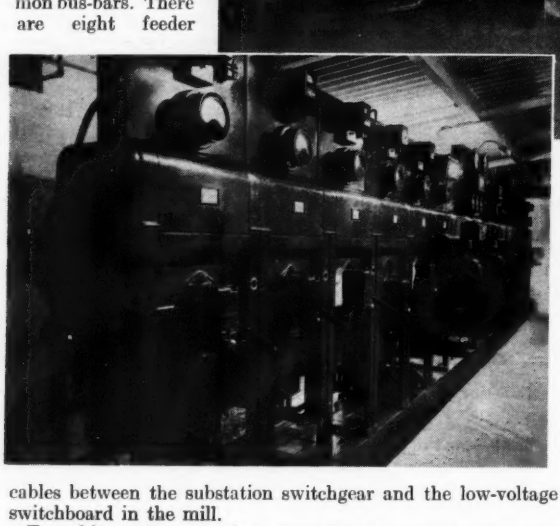
A further benefit of this sectionalisation lies in the opportunity presented for the costing of each department more accurately.

Among other merits of electric power is the increase in output due to steadier drive. The varying weight of paper is best provided for by the variable-speed motor as, obviously, the heavier the paper the slower must the machine travel to

allow sufficient drying time. A better control of the product can be secured by checking up the load on the individual motors, to facilitate which large illuminated dials have been provided on the ammeters.

The modernisation of the electrical system entailed the provision of three fixed cubicle type 1,000-A Crompton Parkinson circuit-breakers in the low-voltage chamber of the power company's substation. The low-voltage switchgear for the mill circuits consist of a 14-panel C.P. switchboard of the "Klad" type, comprising three 800-A incoming feeder switches with parallel feeder reverse relay protection; twelve 500-A outgoing circuit switches, and a main lighting switch. The supply is from two 1,000-kVA, 11,000/400-V transformers to common bus-bars. There are eight feeder cables between the substation switchgear and the low-voltage switchboard in the mill.





Above: The croft, showing the rag boilers and washing and bleaching engines. Left: The low-voltage unit switchboard

To achieve the complete electrification and transference from the old to the new switchgear without disturbing the mill's continuous production, four new feeders were laid in the first instance to allow approximately half of the load to be transferred. Certain of the old feeders were then utilised to form the remaining feeder capacity required. The parallel feeder protection system ensures that failure on any feeder would leave the remaining healthy ones in operation, while special connection chambers have been provided to facilitate the disconnection and reconnection of the cables.

The four 250-HP slip-ring induction type motors installed have special drip-proof enclosure and are of the three-bearing type mounted on slides with a Dawson vee rope drive. An interesting feature is the provision on each bedplate of barring gear. However much care be exercised, there is always the possibility of obstruction in the beaters, and barring gear enables the shaft to be turned at a very slow speed while this is freed; the same gear aids the barring on of the beater driving belts. The motors are controlled by combined stator and rotor oil-immersed starters, provision being made by current transformers fixed in the switchgear for operating a 15-in. sector type ammeter in each beater house.

Provision had previously been made for power-factor correction and now after the installation of a 45-kVA condenser supplied by the Telegraph Condenser Co., an overall correction of 0.93 is obtained. In this connection two C.P. motors were originally installed, one an 80-HP auto-synchronous and the other a 250-HP slip-ring type with belt-driven phase advancer. The maximum demand is approximately 1,500 kW.

The management of the mill has expressed its satisfaction with the electrical equipment, and the way the work was carried out by the Installation Department of the Power Company, with the co-operation of Mr. Cope and Mr. Nuttall, the mill's engineer.

I.M.E.A. Activities

THE Incorporated Municipal Electrical Association has decided not to hold its annual dinner this year. An extraordinary general meeting and the ordinary annual general meeting will be held at Grosvenor House, Park Lane, W., on May 30th and an informal lunch (tickets 8s. 6d. exclusive of wines) is being arranged at the same place.

The Council of the I.M.E.A. has approved the new clause inserted in the I.E.E. Model General Conditions "A" (ELEC. REV., April 12th, p. 433) which has already received B.E.A.M.A. approval.

Action is being taken to ensure that stocks of coal held by public utility undertakings shall be built up during the coming months to ensure that by not later than September 30th the undertakings will have not less than ten winter weeks' supply in hand.

The Council has agreed that a scheme of insurance in respect of war damage to electricity undertakings should be prepared and has referred the matter to the Joint Committee of Electricity Supply Associations.

The members of the Association have been recommended by the National Whitley Council to grant a temporary increase of salary to administrative, technical and clerical staffs. This takes the form of a 6 per cent. bonus for the first £300 of salary plus 3 per cent. of salary in excess of £300 or 3 per cent. of £200 whichever is the less.

The Joint Committee of Electricity Supply Associations has approached the Minister of Home Security with a view to the relaxation of the restrictions upon the use of neon and other outdoor signs during hours of daylight.

The Finance Officer of the London and Home Counties J.E.A. (Mr. A. L. Burnell) recently prepared a memorandum on the transfer of hire-purchase agreements from one electricity to another upon the removal of a consumer when he is unable immediately to complete payment. Difficulties are raised by the varying practice among undertakings in such matters as maximum periods, interest rates, local limitations as to the type of apparatus and absence of hire-purchase facilities in some areas, but all of these can be surmounted.

Mr. Burnell suggests that all undertakings should be prepared to take over agreements on the original terms. There should be no real difficulty, for the number of such transactions is likely to be comparatively small. The cash adjustment between undertakers should be quite simply on the basis of outstanding cost. This would have the effect of passing on to the transferee undertaking the proportion of profit and interest appropriate to the outstanding period of the agreement. It is considered that the matter could be dealt with by a general recommendation by the representative associations to all undertakers or as a national scheme in which undertakers could enrol. Consultation with E.D.A. is suggested; the National Gas Council is said to have a somewhat similar scheme in operation already. The I.M.E.A. Council has agreed to accept the proposals and to recommend them to members.

London Electricity Charges

IN the House of Commons on May 1st Major Sir Jocelyn Lucas raised the question of electricity charges in London. He asked the Minister of Transport if he would take strong action in the matter and guarantee the companies against loss if the price charges were controlled and reasonable.

Captain Wallace said that as he had stated in a previous reply he would not hesitate to have recourse to his powers under the Defence Regulations to ensure that an unjustified burden was not placed upon consumers, if it should be shown to his satisfaction in any individual case that prices had been raised to an undue extent, even within the limits of authorised maximum prices. The questioner would appreciate that any proposal to guarantee the companies against loss would raise questions of policy affecting many other interests, and could not be directed to electricity charges alone.

OVER-RUNNING MEDICAL LAMPS

Effects on Bulb Temperature of Small Inspection Types

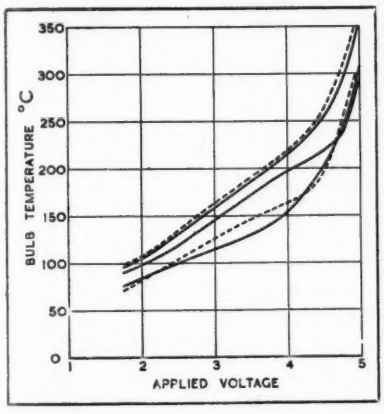
By C. T. A. Harper, B.Sc.

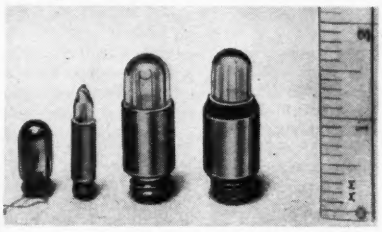
IN the modern hospital operating theatre the anæsthetic in general use is a mixture of ether and oxygen. Such a mixture is capable of ignition over a wide range of proportions, and recommendations have been made as to the precautions to be taken when designing and using electrical equipment in its presence. Attention has been directed recently to a very small but important piece of equipment, the tiny inspection lamps used by the surgeon for illuminating the mouth and other cavities of the body. It is a not uncommon practice to over-run these lamps severely, and it has been suggested that their use in the presence of ether-oxygen mixtures might be dangerous.

Recent work has established that combustion of ether-oxygen mixtures can be started at comparatively low temperatures by "cool-flame" propagation, and it was thought that when over-run the bulbs of inspection lamps might reach a temperature sufficient to start cool flame or normal flame combustion. At the time when this question was raised there did not appear to be any data available as to what temperatures these bulbs were likely to reach when over-run. Measurements were therefore made of the bulb temperatures of various types of medical inspection lamps over a wide range of applied voltages.

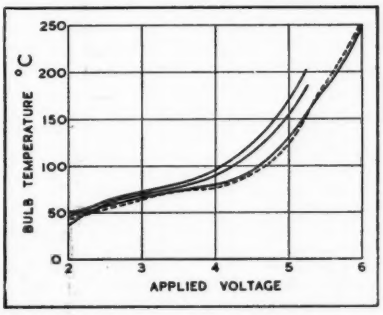
The method employed was to use a fine thermo-couple of the alloys alumel and chromel, 0.2 mm. in diameter. The small size of the bulbs precluded the use of the usual methods of attaching thermo-couples to them. Each lamp was, therefore, held rigid by its base and the couple passed round the bulb, the junction resting on the mid-point of the side. Sufficient tension was then applied to the couple wires so that the junction was in close contact with the glass, and could not slip. The lamp was completely shielded from draughts by a container, 6 in. cube, so that all the measurements were made in still air. Measurements were taken on four lamps of each of the types illustrated except in the case of the uncapped lamp and the pharyngoscope lamp of which five samples were tested.

The lamps were operated on DC. Measurements of bulb temperature were started by under-running the lamp and increasing the volts in quarter-volt steps until failure took place; the values obtained are shown on the curves where bulb temperature has been plotted against applied voltage. The maximum temperatures are the last stable values recorded before failure of the lamp.

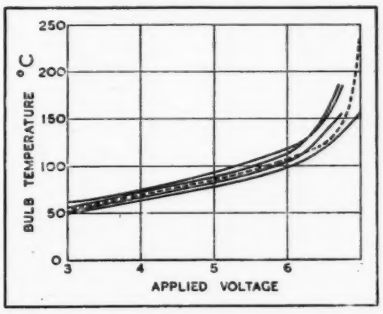




The photograph shows the types of lamp used in the experiments, the scale indicating their size. The curves on the left relate to the first of these, a 2.5-V uncapped medical lamp, and those below to a 3.5-V capped urethroscope lamp

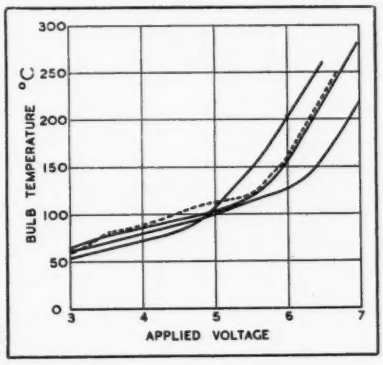


With the 2.5-V, 7-mm. uncapped lamps, bulb temperatures exceeding 350 deg. C were obtained. Two of the urethroscope 3.5-V 5-mm. lamps reached 250 deg. C. For the pharyngoscope 3.5-V 5-mm. lamps, lower temperatures were recorded, but one lamp reached 230 deg. C. before failure. Temperatures exceeding 250 deg. were obtained on two of the capped lamps for ward's flexible. It was not unexpected that lower temperatures would be obtained with lamps fitted with bases of which the surface area was comparable with that of the bulb than with lamps without bases. In the first attempts to measure these bulb temperatures, the thermo-couple was bound with cotton thread, which charred at a loading corresponding to approximately 200 deg. C.



Prior to obtaining these results, it was not realised that over-running the small lamps could produce the steep increases in bulb temperatures indicated by these curves. As it has been established that explosions of ether-oxygen mixtures might be started by hot cauteries at temperatures between 300 and 350 deg. C,* it is evident that some of these inspection lamps could, when overrun, have bulb temperatures sufficient to bring them within the danger range.

The above curves show results obtained with the third of the lamps in the photograph, a 3.5-V capped pharyngoscope type. Those in the graph on the right were obtained with a 3.5-V capped lamp for ward's flexible



It is to some extent reassuring that while seventeen lamps were tested to destruction, in no case did a bulb burst or its external lead wires fuse, but the possibility of this happening in isolated cases cannot be ruled out. Bursting of the bulb in the presence of ether-oxygen mixture would be almost certain to cause an explosion since the explosive mixture would come into contact with the hot particles of filament. Apart from explosion, broken glass is not desirable in a cavity of the body.

As a result of the foregoing experiments and investigation it was suggested that where possible manufacturers of the equipment incorporating tiny inspection lamps should make such provision as would make it impossible for the surgeon to over-run the lamps. If these lamps are operated only at rated voltage, and their attachments and leads are maintained in proper condition, the risk of explosion from this source would be eliminated. As a case has occurred of ignition at 100 deg. C. the bulb temperature of the inspection lamps should not exceed that figure.† All the lamps tested if operated at their rated voltage only would have bulb temperatures below 100 deg. C., except in the case of the uncapped lamps where the value was slightly exceeded.

In conclusion I wish to express my thanks to Messrs. G. Chelioti and H. W. Swann for their guidance in carrying out this work, and to Rimmer Bros. for the photographs of the medical lamps used in the tests.

* *I.E.E. Journal*, Vol. 83, 1938. † *British Medical Journal*, July 30th, 1938.

Thawing Water Pipes

DURING the recent cold spell, Birmingham Corporation Electricity Department, working in conjunction with the Water Department used a portable transformer for thawing water pipes, thus obviating the need to excavate the ground for placing fire buckets near the pipes affected. According to the *Birmingham Post* the time taken varied from twenty minutes for a 40-yard service pipe to forty-five minutes for an 80-yard pipe, and the consumption ranged from 1½ to 6 kWh.

WARTIME DISPLAY

How to Make the Most of Things

By Showroom Manager

THE long light evenings and the increasing shortage of outside salesmen have focused attention to the importance of window display. Window display in wartime requires special consideration. In peacetime the public are interested in almost any electrical appliance, but in wartime interest is largely confined to inexpensive appliances which are considered to be almost a necessity. Another important change has been the introduction of gummed paper affixed to windows to mitigate damage in an air raid or in the black-out. In fact gummed paper has become a sales aid and numerous effective displays have been made with it. Wartime windows must draw attention to the economy and the advantages of electricity as a service, and the theme of displays should be to sell electricity rather than appliances.

Several factors have helped in the selling of a large number of appliances. There have been a great many wartime marriages and electrical gifts have been very popular. However, very few of these newly-weds have been able to set up a home, and therefore, many of the appliances are stored away until the war is over. The severe cold spell and the shortage of coal enabled us to dispose of many electric fires, and the sale of electricity for heating purposes reached new high levels. It is, however, doubtful whether this load was a profitable one.

This is a good time in which to overhaul window protection arrangements. In this connection there was much of interest in the exhibition which was held at the Building Centre some time ago. This exhibition, which was organised by the National Register of Industrial Art Designers, and the Society of Mural Painters, was devoted to examples of different designs which helped to brighten boarded windows in wartime. Many of these designs served to indicate at a glance the type of business hidden behind the board.

Window Dressing

Many showroom managers have made good use of posters, and by cutting out certain illustrations from large posters attractive displays have been made. However, the majority of showrooms have only gummed strips to protect the glass of their windows and usually these strips are changed once every six weeks or so. Some display men change them every time they re-dress the window; this is an excellent plan. Letters can be cut out of quarto paper, and effective messages can easily be written on windows utilising these paper letters. Another device which has proved popular is the use of a long strip of paper cut to represent an arrow which draws attention to a smaller message affixed to the glass. Paper pelmets have also become very popular, and they usually carry a message of some sort. By using paper of different colours the appeal value of the window has been considerably enhanced. Red has been found to be attractive, but too much of it usually has an irritating effect. Blue has dignity, but is somewhat cold and reserved. Green usually suggests rest and comfort, and it is very suitable at this time of the year. Yellow, of course, stimulates cheerfulness, and is an ideal colour for most purposes and particularly as a background for showcards. Black lettering on a yellow background is perhaps the most suitable colour combination.

So much for A.R.P. What of the displays themselves? Obviously any display in wartime must be bright and cheerful. Such a display is of more interest to women than one which reminds them of the horrors of war. Some display men have made use of war pictures in their displays, but this is a mistake, and though the display will attract attention it will not interest the customer in the service we have to offer. Naturally the displays should be original, for any new idea will obviously attract attention. The problem is how to obtain the idea. Perhaps the simplest method is to visit the local library and examine the various trade journals. A draper's or hosier's arrangement will often suggest an idea for an electrical display. It is also a good plan to walk round the main shopping districts of the town at least once a week.

Full use should be made of the latest display aids. For example, there is a new plastic transparency which can be bent into various shapes, and used as a stand or as an ornament. The special corrugated paper which is now available in various colours will hold its shape and act as a support for appliances, or it can be bent into various shapes to act as a background. Artificial flowers definitely add to the attractiveness of window displays. Lupins which can be obtained approximately 20 in. in height are suitable for summer display purposes, and a spray in a vase will catch the eye. A spray of artificial fuchsia about 30 in. high is also useful for tacking on the background. Tinted glass is another novelty which has just been produced, and its possibilities are well worth investigating.

Showcards play a very important part in any display; the golden rules for showcard writing and design are: Keep to simple colour contrasts, and to simple individual letter forms. Good lettering loses its effectiveness when improperly arranged or when executed in wrong colour contrasts. Weak lettering is to be preferred if it is arranged in a well-balanced manner and in harmony with the colours of the showcard. A small spot of bright colour is equal in effect to a large area of dull colour. Borders should be low in tone value when they are wide, and of high tone value when they are thin or narrow. The simplest way to correct errors is to paste a tinted paper to match the showcard colour over the mistake if the error is on a large scale. If the error is only a small one, an eraser slightly damp will remove the surface. Showcards can be made more attractive by dusting on different types of powders, such as gold, silver and bronze, upon a coating or size of varnish.

Atmosphere and Effect

Simple layouts for a display can be prepared involving a geometrical design in two colours, such as yellow and black on a white background. "Atmosphere" can easily be created by using suitable colours, as, for example, the use of yellow with a light green, giving a sunny result. "Effect" can be obtained by carrying out lettering on showcards in different colours. For example the first word might be red on white, or second white on blue, and the process will be reversed at the bottom by showing blue on white and white on red.

Many gas showrooms have arranged attractive displays stressing the importance of the by-products of gas in wartime. E.D.A. has also provided wartime displays, and there has recently been a certain amount of "prestige" advertising drawing attention to the importance of electricity in wartime. There are many themes which can be used to emphasise this matter, and it must be left to each showroom manager to prepare his own interpretation of the story. Given a knowledge of materials and ways in which they can be used to the most effect any salesman should be able to produce a reasonable display, but it is the display man who looks after the small details who will produce the most attractive designs.

It is just as important to ensure that displays within the showroom attract the attention of visitors as it is to ensure that those in the window attract the attention of passers-by. The counter at which a customer pays her account or makes her inquiry should come in for special attention, and every showroom manager would do well to examine the counter once a week and ask himself if there is anything there likely to interest the customer. If the counter is empty the customer will learn nothing, and, on the other hand, if the counter is covered with leaflets the customer will be confused. Strike the happy medium. Have a few leaflets stressing the economy and advantages of electricity and referring to one or two appliances on the counter, and display one appliance only. The leaflets and the appliance will not only act as reminders to the customer; they will act as reminders to your staff to mention these special points and draw the customers' attention to the many advantages of electrical service.

Electro-magnetic Couplings for Ships

WESTINGHOUSE electro-magnetic couplings are to be installed in fifteen ships for the United States Maritime Commission, to be operated by private owners. The first of them is the recently completed cargo liner *Mormacpenn*, which has four 2,250-BHP Busch-Sulzer engines with Falk gearing to reduce their speed from 240 to 85 RPM for the single propeller. The electric coupling has an outer field member attached to the engine shaft and excited by DC from the ship's auxiliary mains; inside it rotates with a slight slip a squirrel-cage member attached to the speed reduction gearing. *Motor Ship* states that the overall efficiency of this arrangement is more than 97.5 per cent., the device acting as a flexible torsion damper, reducing pulsation, vibration, wear and noise. It is used as a clutch for manœuvring, not for speed control.

TRANSPORT CONGRESS

Problems of Operation in Wartime

LAST week the first wartime congress of a transport association took place in London. The Public Service Transport Association is the oldest body of its kind, having been founded 43 years ago as the Tramways and Light Railways Association, and the success of its venture was no doubt largely due to its practical nature.

The proceedings commenced with an informal evening reception on May 1st by the chairman of the Council, Col. Sir Joseph Nall, M.P., who presided throughout the meeting. At the annual business meeting the next morning he pointed out that the Association's revenue for 1939 was the largest on record, there was a good surplus and investments had been nearly doubled. Membership had increased substantially. There was close co-operation between the Association and kindred bodies. The value attached to the conclusions arrived at by the Joint Committee on the Illumination of Public Service Vehicles was indicated by the sales of its report. The Joint Committee on Electrolysis had prepared a new draft code, which had been submitted to the Ministry of Transport, marking very considerable progress in a matter that had caused much trouble to operators of tramcars and trolley-buses.

The representations made by the Association, both individually and with the Municipal Passenger Transport Association and the Omnibus Owners' Association, had helped to secure, among other things, permission to use two masked headlamps, sanction to improved types of headlamp masks, the raising of the maximum height of rear lamps from 3 ft. 6in. to 7 ft. 6 in., and a substantial increase in the permissible intensity of illumination inside vehicles. The position was being watched carefully, and the Association would make any fresh representations which further experience of operation under the existing "black-out" conditions might suggest to be necessary.

The advice and assistance of the Association had been sought by the Ministry of Transport and the Home Office to deal with "flashing" on the overhead equipment of tramcar and trolley-bus routes. The Joint Committee on Overhead Equipment, comprising representatives of the Municipal Passenger Transport Association and the Public Service Transport Association, was making the experience gained by individual undertakings readily available to all members. During the past year this Joint Committee had completed the revision of its specification for overhead equipment. At the request of the Ministry of Transport the Association was dealing with questions relating to the supply of materials for tramcars and trolley-bus routes.

The election of new members of Council, including Mr. John H. Parker, chief electrical engineer, London Passenger Transport Board, in place of those retiring by rotation concluded the formal business.

Lighting Restrictions

Next Mr. Ben England (Nottingham) read at some length the only paper submitted to the Congress, entitled "Ways and Means in Wartime." The author considered that the various restrictions imposed in consequence of the "black-out" should be set before the public in true perspective because there were quarters in which, after the war, any straw would be grasped in an attempt to place new peace-time restrictions upon road traffic.

The general opinion was that the "star light" street lighting, which had been adopted in many places, was very much better than none at all, although it seemed to be of use only on very dark and moonless nights. For liquid fuel rationing purposes in Nottingham motor-bus services were withdrawn from routes on which there were trolley-buses, the latter being augmented to make up the combined previous headways. The electric vehicles also ran for one hour later than motor-buses. After mentioning some of the hastily devised means of obscuring vehicle lighting, the author described in detail the investigations initiated by the Nottingham branch of the Illuminating Engineering Society, the University of Nottingham, the City Lighting Department and his own Transport Department, which resulted in the production of satisfactory directional lighting fittings of the canister-baffle lamp shade type.

For the motor-bus fleet seven varieties of canister were required on account of body variations. The heat evolved by high-voltage trolley-bus lamps had necessitated a special canister shade, throwing light both downward and on to the ceiling. How vehicle exterior side and head lamps could be masked to comply with the regulations was more briefly dealt with, the author stating that there was a strong feeling that the "black-out" pressed hardest on road traffic. There were many who felt that its evils were a very heavy price to pay for whatever one had in return, but the author did not consider that much amelioration could be expected so far as public service vehicles were concerned.

Several differing ways of minimising overhead trolley-wire flashing were briefly referred to, as was also the successful trial at Nottingham of B.T.H. "announcerphones" in vehicles, 24-V equipment for motor-buses and 500-V for trolley-buses, with double microphones, amplifier and loud speaker in each saloon.

The subsequent discussion turned mainly upon operational and traffic aspects; the possibilities of alternative fuels, electric traction hardly being mentioned; and difficulties of obtaining materials of vehicle repair and maintenance. Such electrical references as there were concerned the lighting restrictions. For instance, Mr. Harry England (West Riding Co., Wakefield), the author's father, spoke with some feeling of the "black-out," which he considered to be an imposition. Was the industry prepared to go through next winter under the same handicap? Mr. W. Williamson (Midland Co., Langley Mill) also remarked upon the influence of vehicle lighting on road accidents, stating that one type of head-lamp mask was on the market (more expensive than the official pattern) which provided 2 ft. c. right across the width of the road. Flashing from trolley-bus collector wires was apt to be much greater along the wire itself, when coated with frost and ice, than at section points, ears, &c.

Lamp Shading

Mr. S. J. Patmore (G.E.C.) referred to lamp photometry, disagreeing with the author's statement that an opal bulb was necessary to obtain the full effect from canister shades, because it absorbed more light than a pearl lamp did. Mr. J. M. Calder (Reading) preferred to rely on painted bulbs rather than on what he termed "fancy" lamp shades.

The 275 congress delegates were augmented to 291 for the Thursday luncheon, which took the place of the Association's annual dinner. Capt. Euan Wallace, Minister of Transport, was the chief guest, other speakers including Sir Joseph Nall, Mr. Sidney Garcke, Mr. T. E. Thomas (president of the Institute of Transport), and Lt.-Col. D. C. McLagan (secretary of the Society of Motor Manufacturers and Traders), the luncheon terminating with the presentation of the Maynard Cup and replicas to Messrs. G. B. Cary (Manchester) and W. G. Woods (Chloride Co., Manchester) which had been contested for the day before on the Moor Park golf course.

On the Friday morning there was further discussion, informal and mainly in continuation of the previous day's topics. Mr. A. C. Baker (Birmingham) recalled that at the outbreak of war several bodies and different committees were all pulling in different directions when the trade unions stepped in and obtained a definite ruling about the interior lighting of vehicles. There was now great need for some modified form of illumination to enable trolley-bus overhead wires to be repaired and tramway track to be relaid without doubling the time and cost of such work.

Mr. L. G. Wyndham Shire (Birmingham and Midland Co.) remarked that 0.1 ft. c. was the bare working minimum amount of illumination. Fog lamps fitted with masks were quite useless, but they could be useful if the orifice was not more than one inch so as to reduce the amount of light reflected back by the fog.

Mr. W. Lund (B.T.H. Co.) presented research data which indicated that it was worth while trying to obtain the correct shape of lamp beam by means of an appropriately shaped filament so that the back portion of the reflector could be usefully employed to emit light. The list price of 24-V lamps was the same for "line" or "V" or "U" filaments, there being an extra 3d. on the list price of "U" filament bulbs for 12 V.

Mr. J. C. Fenton (British Belting & Asbestos, Ltd.) referred to the increased sickness of employees last winter and the benefit which they had derived from artificial sunlight and ultra-violet-ray treatment at the Bradford Corporation Baths. He personally had tried such treatment and was considering the installation of equipment at his works.

Recovery of Track Material

Sir Joseph Nall suggested that owners of tramway track, particularly points and crossings, which were about to be scrapped but were still in a usable condition, might with mutual benefit offer them to authorities which needed them for track repair purposes, so saving the time and expense involved in turning them into re-made steel.

Mr. Ben England, in reply to both discussions, reiterated his belief that, apart from coastal areas, transport could be allowed more light without assisting the enemy. Light escaping from buildings was a much greater offender than that shown by vehicles. No matter what sort of lamp mask was designed one always came up against the official regulations. He would be very surprised if painted bulbs could be made anything like so useful as shaded lamps. Fog lamps which projected a large beam were of little use; they must be properly fitted, adjusted and used by the driver.

Mr. Eric D. Croft, secretary, has returned to the Association's permanent office at 307, Abbey House, Victoria Street, Westminster, S.W.1, to which all business communications should now be addressed.

I.E.E. COUNCIL'S REPORT

National Service Activities

THE report of the Council of the Institution of Electrical Engineers, which was to be presented at the sixty-eighth annual general meeting in London yesterday, shows that during the year ended March, 1940, the membership increased by 828 to 19,872, and deaths numbered 122, including three members killed on active service. At that date 705 members were serving in the fighting forces, and the arrangements made to ensure that they are posted to technical branches have, with very few exceptions, been entirely successful. Students who are nearing the completion of their studies for important examinations have, from patriotic motives, been reluctant to apply for postponement of their military service. More recently the Schedule of Reserved Occupations has been amended to ensure that part-time students, engineering apprentices and learners will be enabled to complete their studies.

With regard to the Central Register of professional persons which is being compiled by the I.E.E. in co-operation with the Ministry of Labour and National Service, the response has been 5,540 volunteers to do appropriate paid work of national importance in wartime, plus 3,077 cards returned for I.E.E. record purposes. An immediate demand for personnel in the telecommunications (and more particularly radio) services caused the Register to be enlarged in addition to the setting up of a subsidiary Register; the result of the latter has been 260 volunteers, plus 787 record cards. Placing panels have submitted 884 names to fill 420 vacancies, and a large number of appointments have been confirmed. As a means of providing technical personnel for branches of the industry in which there was a probability of shortage, the I.E.E. is discussing with the Ministry of Labour the formation of a training pool for engineers possessing suitable basic technical qualifications.

The Institution has offered to assist or provide information for the defence services and Ministry of Home Security, the advisory committee set up for this purpose having in particular collaborated with the British Standards Institution in the preparation of various specifications.

Plans for an Emergency

Some 85 meetings of kindred societies were held during the year in the I.E.E. headquarters building in London, which has been "blacked-out" and provided with basement air-raid shelters. Provision has been made to evacuate the office and staff to Weybridge, Surrey, at short notice, but in any event it is hoped to keep the I.E.E. open with a nucleus staff and to maintain the reference and lending libraries in London. The total number of readers during the year was 5,587, of whom 784 were non-members, representing decreases of 1,646 and 229 respectively; 2,224 books were issued from the lending library to 1,042 borrowers, being decreases of 686 and 154.

The average attendance at the eight ordinary meetings held in London since the resumption of proceedings in the New Year was 256, which was slightly larger than for last session. Apart from social functions, most of the provincial centres also resumed proceedings in the second half of the 1339-40 session. The Meter and Instrument Section membership is 733, the average attendance at five meetings being 91 against 114. This section welcomes short demonstrations of apparatus or processes, which need not necessarily relate to the subject matter of the paper which is being read on the same evening.

The Transmission Section membership is 1,683, the attendance at four meetings averaging 82 against 98. The Wireless Section membership is 1,087 and the attendance at four meetings averaged 125, compared with 195. The attendance at informal meetings averaged 87 against 65 last year. Meetings, visits to works and social functions were enjoyed by the nine students' sections, the membership of which aggregates 4,392, including 1,971 graduates.

Proposed New Section

Some of the rules for students' sections have been amended and by-laws revised for the North-Eastern Centre, Tees-side Sub-Centre and the North-Eastern Students' Centre. Plans for the formation of a new Installation and Utilisation Section had reached an advanced stage in preparation for inauguration when conditions permit.

The name of the I.E.E. examination has been changed from "Graduateship" to "Associate Membership," without alteration of subjects, syllabuses or standard. During the year examinations were held for 666 candidates in nine towns at home and twelve countries overseas. Examinations in English only were also held at various centres, as well as for 248 holders of National Certificates in electrical engineering, of which 1,691 were awarded in England and Wales and 74 in Scotland. In addition, 21 theses were submitted in place of sitting for examinations. Eight scholarships and three grants in aid were awarded.

The I.E.E. benevolent fund capital account stands at £23,863. The income was made up of £1,111 from investments, £1,652 from 3,305 annual subscriptions and £2,287 from 3,295 donations. During 1939 grants were made to 80 persons, totalling £3,815, thus providing for the needs of 58 dependants. While last year there was a surplus over expenditure, there is some anxiety about the increased demands on the fund expected to result from war distress.

Insulation Progress

A LECTURE illustrated by lantern slides was given last Friday by Mr. H. Warren (director of research, B.T.H. Co.) before the I.E.E. Meter and Instrument Section on the subject of "Insulation." He showed how during the last twenty years the electrical industry had used a wide range of synthetic resin mouldings in the development of which it had materially assisted, and the phenolic-formaldehyde compounds were still in the forefront, having been greatly improved and made more adaptable and cheaper. The lecturer showed slides of the synthetic resin and powder manufacturing plant of one electrical concern which had a capacity of 100 tons of products per month. He then reviewed progress from the time when the moulding of hard rubber radio parts took 30 min. and the curing 24 hr. to the present time when synthetic mouldings could be completed in about 3 min.

Dealing at some length with "tracking" (surface carbonisation), he showed by means of a 12 in. induction coil how the carbon spot travelled from the cathode to the anode and how the partial substitution of mineral filler (e.g., talc or silica) for wood-meal filler had produced material that might, with caution, be described as "anti-tracking" though not "non-tracking" as hard rubber was.

Reference was made to some of the newer synthetic resins, i.e., polyacrylic, polyvinyl, polystyrene and polyethylene with especial mention of Formex wire enamel, which was so tough that in certain applications one could dispense with the usual cotton covering on enamelled wire. The elimination of varnish throwing by the use of thermo-setting varnishes, and the achievement of complete impregnation without cavities by the use of oleo-synthetic resin, were then dealt with.

After a discussion of chlorinated diphenyls (with their merit of high permittivity) as a non-inflammable non-sludging substitute for mineral oils, high-frequency insulating materials were referred to briefly, attention being called to the synthetic materials which have desirable loss factors, and to the rutile ceramic bodies, which have very high permittivities. The lecturer then passed to woven-glass insulation which, with suitable varnishes, enabled machines to be run at temperatures very much higher than present standards and glass for vacuum devices, such as electric-discharge lamps.

A new method of pressing insulations on coils, eliminating the use of expensive moulds and employing hot steel shot for applying the pressure, and a relatively new system of radiant heating for stoving protective films were other items that indicated the continued advance that is being made in insulation technique.

Circuit-breaker Mechanics

MECHANICAL integrity in the design of oil-immersed circuit-breakers was discussed in a short paper by Mr. M. C. Hunter (British Thomson-Houston Co., Ltd.) which was read before the Transmission Section of the Institution of Electrical Engineers in London on May 8th.

Means of guarding against imperfections which might arise during manufacture were suggested, as well as those necessary to prevent changes of friction affecting reliability in service. A series of practical routine tests was put forward to ensure that calculated design factors were complied with, so improving the standard of workmanship.

Contact friction and mass of moving parts were the two principal factors in design, but no part could be left out of consideration. Thus co-ordination would result from design studies in rational sequence. It was impossible to translate design calculations into successful finished products without some knowledge of the traditions and standard of workmanship of the factory which was to do the work. The whole basis of the design could be nullified if vigilance were not exercised to ensure that in production each and every operating mechanism satisfied requirements.

While disclaiming any intention of attempting to lay down final factors of assurance for all classes of circuit-breakers and for operating mechanisms, the author stressed the need for general recognition of the fact that serious design could not be attempted until factors of assurance had been decided upon. Having done so, there was then an absolute necessity that such factors should be verified, not only by type tests but also by routine tests in production.

The paper concluded with illustrations of apparatus.

CORRESPONDENCE

Every letter must be accompanied by the writer's name and address preferably, but not necessarily, for publication. The Editors cannot accept responsibility for correspondents' opinions

Treatment of Consumers

WITH reference to your leading article of April 26th, "The Approach to Consumers," I think that the terms "flat rate" and "two-part tariff" mean to many, if not the majority, of consumers (domestic) exactly the opposite to what the undertakings wish to imply. People have often said to me something like the following: "We are on the flat rate. It is much the best. We pay a flat 30s. per quarter and ¾d. per unit for all current. It is much simpler than the two-part rate and having to have two meters in the house." It needs a lot of careful explanation to convey to these people the true meaning of the different tariffs, and even then, sometimes one has the feeling that they do not or cannot understand.

I think that the usual tariff of the Northamptonshire Co. is very simple and fair; if I remember rightly, the first 7 kWh *per annum* per £1 of rateable value are charged at 6d., and all in excess are charged at ¾d. It means that if a house is shut up for a quarter, and no current is used, no money has to be paid. It applies also to cottages with slot meters and the excess money is refunded when the meters are read. It puts the large rambling farmhouse, with thick walls, long passages and large unused spare rooms on the same footing as a modern compact house in a town, whereas if the fixed charge is arrived at by the number of rooms, or the superficial area, measured outside the house, the old farmhouse comes off very badly.

People in different areas receive different treatment by the supply authorities. In the area of one authority a customer of mine (after a year's trial on the flat rates with two meters) decided to go on to the two-part rate and when the district representative went to count up the number of rooms, he wanted to include the hall and a greenhouse which was not attached to the house at all. He also insisted on counting the old stables that were not wired or used, except to keep the mowing machine and garden roller in.

Another customer of mine in the same area has to pay on about five unused attics, for the fixed charge of the two-part tariff, whereas I know a house in another area of the same company, where the district representative was not so stupidly full of red tape, which did not have the unused attics counted as rooms. I know a case where a bedroom was made slightly larger than the maximum size of a "room" of 30 sq. yds. by the inclusion of a small dressing room, that by itself would not have been counted as a room, but the power company man insisted on counting it as more than one room. It is for the above reasons and for the reason that a district representative can himself decide how much of outbuildings to a house he measures up and counts, whether he counts the lofts in them or not, and whether he counts wooden buildings or not, that I think the Northamptonshire Company's tariff based on the rateable value is so fair.

Another sore point with many consumers, or would-be consumers, is the charge for services sometimes imposed. In one power company's area, if a house is within 30 yards from a pole it gets a free service, but if it is up a side lane, or a bit detached from where the company has put its poles, then the occupant has to pay for excess cable, or rather he pays towards it and the cable still remains the property of the company. I know cases in which a rich resident has had to pay towards bringing the high-voltage line to the village.

It is a great pity that the war has prevented any action being taken on the McGowan Report.

Warwick, *May 5th.* LAURENCE B. JOYNSON.

Suggested Economy

Would it not be easy now that paper is scarce and postage up to ask advertisers to state the salary they are prepared to offer when advertising a situation vacant—so saving paper, post space, applicant's time, and, last but not least, postage?

April 30th. "ONE WHO ANSWERS."

Emergency Substations

Central Board's Demonstration

A DEMONSTRATION substation has been erected near London and equipment has been installed from the "pool" set up under the Civil Defence Act for restoring supplies quickly after a major supply failure. A tee-connection from a 33-kV line of the Central Electricity Board is run to a temporary wood pole from which the conductors are shackled off to the bushings of a 20-MVA transformer, the full output of which is obtainable at either 11 or 6.6 kV.

The lower-voltage connections are taken to a four-bay switchboard, comprising one transformer and three feeder switches, which incorporates spring-closure mechanism either manually or electrically controlled from adjacent pillars. Transformer connections are brought out opposite the feeder circuits and the whole lay-out has flexibility in view. One switch is arranged for three single-core cables, the structure carrying the sealing ends being brought up close to the switchgear structure in order to illustrate how space limitations can be overcome. A preferable arrangement with more generous spacing is that of the second feeder circuit which provides for three single-core cables per phase. The third switch is arranged for connection to an overhead line.

The transformer, like all "emergency" units of more than 10,000 kVA, is of the OFB type, thus economising space and facilitating transport through the elimination of the separate oil coolers required with the ordinary ON/OFB designs. Duplicate fans and oil pumps are installed on the transformer, as is also a 30-kVA transformer from which a 400/230-V supply is taken for auxiliaries, lighting, &c. The earthing system consists of about half a dozen 6 ft. galvanised-iron rods.

Those parts of the switchgear that have to be connected to the feeder circuits are completed first, so that the cable work can be carried out without interfering with the erection of the substation. In the demonstration station no cables have actually been connected, but the two supporting gantries could have been made available within three hours of the start. As special emergency joint boxes filled with cold-setting compound are used, two hours at the outside should generally be required for jointing.

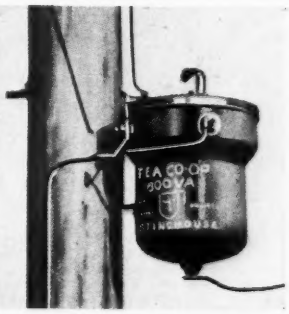
This substation was erected as if under emergency conditions, except that no work was done during the hours of darkness. The equipment was picked up at the store twenty miles away at 7.30 a.m. and made alive at 6 p.m. on the following day, the actual erection time being nineteen working hours.

Transformers in the pool vary in capacity from 5,000 to 30,000 kVA and can be despatched to the scene of trouble by either rail or road complete with cooling gear, bushings and conservators in position. Only such parts as brackets and insulator supports, which may vary with local circumstances, are left to be fitted on site—an hour or so's work. All normal voltages and two-phase systems are catered for.

The switchgear (66, 33 or 22 and 11 or 6 kV) has been especially developed with a view to rapid erection either in or out of doors, and is arranged for connections to either cable or overhead lines. Cables kept in store are all of the single-core type. Overhead-line material, including jumpers, is kept available for all voltages up to 132 kV. The C.E.B. has arranged with transport contractors for emergency service and with switchgear and cable manufacturers for skilled men.

Porcelain Transformer Tanks

EFFORTS to develop small capacity transformers of low cost for pole-mounting in rural distribution service have resulted in smaller oil-containing tanks while the size of the bushing-type insulator has remained fixed by the voltage. This trend of the insulator and tank to become almost of equal size has not been resisted by American Westinghouse designers. Instead, they have boldly eliminated the tank altogether, making the case which encloses the windings entirely of porcelain. Such a transformer of 600 VA for stepping down from 7,200 to 100 V is said to weigh, complete with oil, only 60 lb. The only remaining vestige of the customary steel tank is a metal top cover from which the core and porcelain case are suspended.



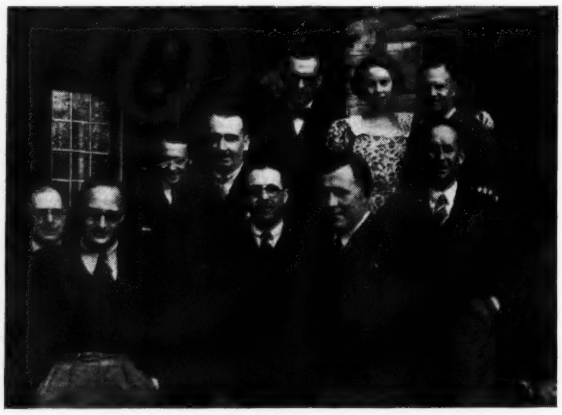
Rural transformer enclosed in porcelain tank

PERSONAL AND SOCIAL

Information regarding new appointments and other matters of interest for this page are welcomed

TONBRIDGE (Kent) Urban District Council has appointed **Major Frank Springate,** deputy electrical engineer, to succeed **Mr. J. C. Ellis** as electrical engineer, conditional upon his release from military service and taking up his duties within six weeks from April 22nd. Major Springate has been with the undertaking for twenty-eight years and is at present on service in the Royal Engineers. He has been a Territorial for many years and served in the 1914-18 War.

Mr. E. P. Lucking, of George Ellison, Ltd., gave a golf party recently at Burhill, Surrey, to a number of well-known men in the electrical industry. The accompanying picture was taken at Mr. Lucking's house at Esher on that occasion and shows (from left to right): Messrs. Auger, Rudd, Paling, Wood, Jarvis, Sharples, Cresswell, Mr. and Mrs. Lucking, and Mr. George.



Electrical men who were recently entertained by Mr. and Mrs. Lucking at a golf party

Col. G. D. Ozanne tells us that Mrs. Ozanne has opened a shop opposite Olympia for the collection and sale of all kinds of things in order to raise funds for purchasing wool for knitters who are making comforts for members of the Royal Corps of Signals. Mrs. Ozanne will welcome gifts and will arrange to collect them if necessary. The address is 18, Trevor Place, S.W.7. (Telephone: Kensington 3117.)

At its meeting on May 1st, the Halifax Corporation confirmed the appointment of **Mr. T. M. Blackburn** as deputy borough electrical engineer and manager. Mr. Blackburn has been distribution and installation engineer with the Halifax electricity undertaking for the past nine years, and from April, 1939, to March, 1940, was acting engineer and manager. The appointment dates from April 1st, 1940, at a salary of £700 per annum. In addition to the increase in salary an honorarium of £250 has been granted for the extra services rendered by him during the past twelve months. A sum of £100 has also been divided among three other members of the staff, Messrs. Topley, Wrigley and Sharpe, as an appreciation of additional work carried out by them during the same period.

Presentation to Mr. G. H. Nelson (chairman and managing director of the English Electric Co.) Left to right: Miss E. R. Peatfield (secretary Staff Committee), Mrs. G. H. Nelson, Mr. G. H. Nelson, Mr. H. Williams, (secretary Works Committee), Miss Nelson, Mr. J. Rogers (general manager of works), Mr. C. H. Shardlow (chairman, Works Committee)

Mr. T. Woods, of Downes & Davies, Liverpool, is the president of the Electrical Wholesalers' Federation for 1940-41.

Mr. C. C. Bleach, of Cardiff, has been elected president of the South Wales Branch of the Association of Mining Electrical Engineers for the session 1940-41.

Mr. C. S. Brookes, of Basingstoke, has been appointed principal technical assistant with the Nuneaton Corporation Electricity Department.

Mr. A. E. Jeans, at present assistant electrical engineer with the Brentford and Chiswick Borough Council, has been appointed borough electrical engineer in succession to **Mr. A. W. Money,** who is retiring in June. The salary is £840, rising to £1,000 per annum.

Presentations have been made to **Mr. F. S. Coates,** who is leaving Alnwick, Northumberland, after twelve years as district engineer for the North-Eastern Electric Supply Co., Ltd., to become district manager at Leeds for the Yorkshire Electric Power Co.

Winners of the North Western and North Wales Area E.D.A. public speaking competition, decided in Manchester a few days ago, were:—Men: (1) **Mr. E. R. Constance** (Metropolitan-Vickers Electrical Co., Ltd.), who spoke on the special advantages of electrical hot water; and (2) **Mr. H. T. Brown** (Salford Corporation). Ladies: (1) **Miss J. Winstanley** (Salford Corporation), who discussed the case for the electric road vehicle, and (2) **Miss G. M. Wood** (Wrexham Corporation). The prizes were presented at an E.D.A. luncheon meeting at Manchester by Mr. J. H. Farthing. Mr. A. J. Hutchinson, chairman of the N.W. Area E.D.A. presided.

To mark the twenty-first anniversary of the English Electric Co., Ltd., members of the staff and employees at the Stafford works on April 29 presented a service of silver plate to **Mr. G. H. Nelson,** chairman and managing director of the company. The presentation took place at the works and included a gift to Mrs. Nelson in the form of a finger watch. Mr. J. Rogers (general manager of works) presided. Others present, in addition to Mr. and Mrs. Nelson, included Miss Nelson, Mr. J. W. C. Milligan (assistant to the general manager), Mr. W. K. Foster (chairman of the staff committee), Mr. C. H. Shardlow (chairman of the works committee), Mr. H. Williams (secretary of the works committee) and Miss E. R. Peatfield (secretary of the staff committee).

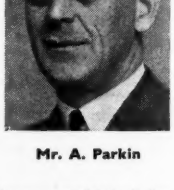
Mr. Shardlow, in presenting the silver plate to Mr. Nelson, explained that the presentation was intended to recognise in a small way the great work, inspired leadership and devotion which Mr. Nelson had given to the company. Mr. W. K. Foster, supporting Mr. Shardlow, referred to the prosperity that Mr. Nelson had brought, also, to the company's other works at Bradford, Rugby and Preston. In acknowledging the gift, Mr. Nelson said that much of the unhappiness and discontent was due to irregular employment, and the provision of regular employment, rather than peaks of prosperity, was the policy that he had always endeavoured to follow with the English Electric Co. While they were commemorating the twenty-first anniversary of the English Electric Co. it had to be borne in mind that the company comprised a family which was a great deal older than twenty-one years. Two of the companies—the Stafford works being one—had been in existence for seventy-five years, and there was a vast amount of accumulated experience and knowledge behind the firms which joined twenty-one years ago, to become the English Electric Co., Ltd.

In a charming speech Mrs. Nelson expressed her appreciation of the token which had been given to her.

Similar presentations are shortly to take place at each of the company's other works.

London Transport Board Reorganisation.—Consequent on the retirement of Mr. Frank Pick from the posts of vice-chairman and chief executive officer of the London Passenger Transport Board on May 17th, changes in organisation have been made with effect from May 3rd. The position of chief executive officer has been abolished, and the work of the Board has been divided into departments as follows: Secretary and chief legal adviser, Mr. C. G. Page; comptroller, Mr. L. C. Hawkins; chief commercial manager, Mr. R. McDonald; general manager (operation), Mr. T. E. Thomas; engineer-in-chief, Mr. V. A. M. Robertson; executive officer for staff and staff welfare, Mr. J. Cliff; principal officer, special duties (attached to chairman's office), Mr. I. Fraser. Mr. Pick, whose forthcoming retirement we recently announced, has completed thirty-four years' service with the London transport services, and the Board has placed on record its appreciation of his great work.

Mr. A. Parkin, Area Officer of the British Electrical Development Association, Northern Counties Area, since 1927 has been gazetted lieutenant in the Royal Army Ordnance Corps and has now taken up his duties. Mr. Parkin held a commission with the Durham Light Infantry for four years during the last war.



Mr. A. Parkin

Mr. H. R. Beasant, M.I.E.E., electrical engineer to the Bristol Tramways and Carriage Co., Ltd., has been nominated for the chairmanship of the Western Centre of the Institution of Electrical Engineers for the session 1940-41.

At Milton Court, Dorking, on May 1st, **Sir Montague Hughman** made a presentation of long service certificates to members of Henley's head office staff who had completed twenty years' service with the company. These ceremonies have been annual events at Henley's head office, works and branches since 1928, and altogether 935 certificates have been presented. For this year's presentation 105 members were eligible. By a happy coincidence **Mr. W. F. Bishop,** director and general manager of Henley's, who was present at the ceremony, was celebrating his forty-fifth anniversary with Henley's, having joined the company on May 1st, 1895.

Mr. N. Tegetmeier, A.M.I.E.E., informs us that in addition to agencies he at present holds in Wales for Bulpitt and Sons, Ltd., British Mechanical Productions,

Ltd. ("Clix") and Le Carbone, Ltd., he has been appointed agent for the same area by Aidas Electric, Ltd., for their "Sadia" electric water heaters and circulators. Mr. Tegetmeier's address is 81, Newport Road, Cardiff.

Obituary

Mr. G. W. Partridge.—Many of our readers will learn with regret of the death of Mr. Gerald William Partridge, M.Inst.C.E., M.I.E.E., which occurred on May 3rd. Mr. Partridge was a pioneer of the electricity supply industry, and his association with the London Electric Supply Corporation, Ltd., of which he was a director, extended over fifty years. He was educated at Hammond College, and served his apprenticeship with the Anglo-American Brush Co., before he became connected with the London Electric Supply Corporation, Ltd., at the Grosvenor Gallery station in 1888. His work at this power station and later at the Deptford station, in association with Ferranti, formed a valuable contribution to the electricity supply development in this country. In those early days much of the work at Deptford power station was of an experimental nature, and he had many inventions to his credit, among them being the first oil switch, designed by him in 1892, and the sparklet fuse.

The late Mr. G. W Partridge

Mr. Partridge became manager and chief engineer of the London Electric Supply Corporation, from which position he resigned in 1931 owing to failing health, although he continued as a director of the company up to the time of his death. During the last war, in addition to his work at Deptford, he was Director of the Metropolitan Munitions Committee. He became joint chief engineer to the London Power Co. with the late Sir Alexander Kennedy, and was chief engineer for a time. Mr. Partridge was a director of a number of electricity supply companies, including the British Power and Light Corporation, Ltd., the North Wales Power Co., Ltd., and the Ringwood Electric Supply Co., Ltd. He was also a director of the Calcutta Tramways Co., Ltd. The cremation took place at Golders Green Crematorium on May 6th.

Mr. C. Faraday Proctor.—It is with regret that we have to report the death of Mr. Charles Faraday Proctor, M.I.E.E., M.I.Mech.E., which occurred on May 4th at the age of 79. Mr. Proctor served an engineering apprenticeship with Watson & Sons, Newcastle-on-Tyne, after which he entered the private laboratory of Mr. (later Sir) Joseph Swan, to assist in development of his lamp.

In 1881 Mr. Proctor went to Paris with Mr. J. Swinburne to start a lamp factory, they having first made a few lamps in Antwerp for the purpose of securing patent rights (probably the first practical incandescent lamps made on the Continent, November, 1881). In November, 1882, Mr. Proctor returned to England to introduce some improved machinery and to assist in the enlargement of works at Newcastle and Low Fell. In 1884 he again went to the Continent to assist in the re-installation of the Lille factory of the Swan Company, which had been destroyed by fire. He was appointed manager of these works in 1886, which post he held until the amalgamation of the Edison & Swan Continental companies which, under the title of Compagnie Générale des Lampes Incandescentes, decided to build a new factory at Ivry-sur-Seine, of which Mr. Proctor was appointed engineer.

Returning to England, he rejoined the Edison Swan Company and was appointed assistant manager of the Ponders End works and in 1900 was transferred to the South Benwell lamp factory. During his connection with incandescent lamp manufacture, Mr. Proctor introduced many improvements in the machinery and especially in the exhausting of the lamps. He also introduced many improvements in electric lighting fittings, the more notable of which were the shortened form of lampholders (the S. insulator pattern having been patented by him in conjunction with the company), also other forms of holders, switches and fuses. Mr. Proctor had been living in retirement for a number of years.

Mr. J. Lockhart.—The death occurred at Dundee on May 3rd of ex-Bailie James Lockhart, chairman of Maxwells (Dundee), Ltd., electrical engineers, and other companies.

Mr. H. Dyson.—The death occurred on May 2nd of Mr. Harold Dyson, chief estimator of Brook Motors, Ltd. Mr. Dyson, who was fifty-three, had been with the company for nearly twenty-five years.

N.P.L. Report for 1939

THE annual report of the National Physical Laboratory (director: Dr. C. G. Darwin) for 1939 indicates that the Laboratory is again playing its part in the war effort in a somewhat similar manner as in 1914-18. Dispersal of the scientific staff has not been allowed; some members have been lent for short periods to other establishments, while much of the work previously done for Government Departments has expanded considerably. But there has not been any great falling off in the routine of giving advice and investigational help to industry.

Collaboration in the Physics and Engineering Departments (superintendents: Dr. G. W. C. Kaye and Dr. S. L. Smith) in the combination of X-ray diffraction analysis of the crystal structure of metals with mechanical tests has provided a valuable technique for fundamental investigations of the strength of materials.

In the Electricity Department (superintendent: Mr. R. S. J. Spilsbury) the Standards Division has been mainly concerned with high precision measurements of condensers and inductors at telephone and radio frequencies. The investigation of plastic insulating materials is continuing; among the substances examined have been laminated boards made of paper impregnated with various resins and composite dielectrics loaded with silica.

The Electrotechnics Division has been very busy examining electricity meter-testing equipment; the main portion of this work is now practically complete, but re-examination will continue to be called for. Studies of surge phenomena and insulation characteristics continue for the E.R.A. and C.E.B. in the high-voltage laboratory.

Under the agreement between the Department of Scientific and Industrial Research and the Association of Short-Circuit Testing Authorities several circuit breakers were submitted for test last year, rated at 100,000, 150,000 and 250,000 kVA at up to 11 kV. Certificates of performance were granted by the N.P.L. in four cases. The importance of type tests was shown by failure in more than one instance, indicating the necessity for substantial modification of design. Such a test, usually lasting less than a second, provides about a dozen oscillograph records on a moving film which can normally be examined within two minutes of making the test. A complete series involves the analysis of about 180 oscillograph records.

In the new Light Department (superintendent: Mr. T. Smith) the Photometry Division has been of assistance to the Ministry of Home Security in a number of "black-out" problems. Apparatus has been devised for the gauging of very small degrees of illumination, even by unskilled observers. For many such purposes actual measurement is not necessary; it is sufficient to determine whether the light is below some fixed definite standard. The portable gauge designed to do this does not utilise a standard lamp; instead comparison is made with a radium luminous compound "paint," which has quite a good life before it must be renewed. By suitable modification the instrument can be employed for measurement instead of mere gauging. A simple photometer has also been designed for fluorescent and faintly luminiscent materials. "Complementary" lighting has been studied, the adjustment of the colour-pairs being described as very delicate.

The Radio Department (superintendent: Dr. R. L. Smith-Rose) is mainly concerned just now with a programme of fundamental research at wavelengths below 10 metres, frequencies above 30 Mc/s, and with the practical possibilities of radio direction finding at all wavelengths down to two metres, frequencies up to 150 Mc/s.

In the Aerodynamics Department (superintendent: Mr. E. F. Relf) new equipment is now in an advanced stage of construction, including a control table with the necessary instruments for use with the electrical balances of the high-speed wind tunnels. An innovation is the use of a small DC generator driven by a synchronous motor to replace the battery for energising these balances.

At last week's official send-off of the first of the mobile canteens which the E.A.W. is providing to operate among anti-aircraft, searchlight and balloon barrage units: Right to left, Lt.-Col. B. C. Hartley, Director of the Army Sports Control: Miss Caroline Haslett, Director of the E.A.W.; Mrs. Robert Bingham and Mrs. William Paterson, both of whom are presenting the Association with canteens. The President of the E.A.W., the Dowager Lady Swaythling, is seen inside the canteen

NEW ELECTRICAL PRODUCTS

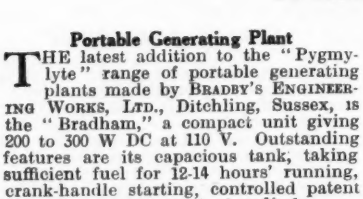
A Review of Equipment Recently Marketed

Portable Generating Plant

THE latest addition to the "Pygmylyte" range of portable generating plants made by BRADBY'S ENGINEERING WORKS, LTD., Ditchling, Sussex, is the "Bradham," a compact unit giving 200 to 300 W DC at 110 V. Outstanding features are its capacious tank, taking sufficient fuel for 12-14 hours' running, crank-handle starting, controlled patent carburettor, "Wico" single-cylinder magneto, lightness and compactness.

The dynamo is directly coupled to a 1½-HP single-cylinder air-cooled four-stroke engine fitted with a patent suction type carburettor which has an adjustable throttle and choke, enabling the speed to be regulated up to 2,500 R.P.M. The petrol consumption at full load is 0.67 pint per hour.

The set is suitable for small houses and dwellings, hospitals, air-raid shelters,



"Bradham" portable generator

etc., and for stand-by purposes. It is intended for direct lighting and batteries are therefore not required.

Mercury Vapour Rectifier

The GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, W.C.2, is replacing its mercury rectifier type "GU5" with the new "GU50" valve, which incorporates many modifications designed to improve the reliability factor under maximum conditions of operation. Various new radio valves are also announced.

Window Lighting Fitting

MR. S. H. BAILEY, 35, Baginton Road, Coventry, informs us that he proposes to place on the market shortly a shop window lighting fitting embodying the same principles as those already satisfactorily employed in the "Monitor" car side-lamp mask. The unit is claimed to enable more effective use to be made of the light permitted under the A.R.P. Regulations.

Insulation Tester

The "Hum Metrohm" self-acting insulation tester made by EVERETT, EDGCUMBE & CO., LTD., Colindale Works, N.W.9, can be held and used with one hand, while the other is free to pick out the particular circuit to be tested.

This dual-purpose instrument, measuring 8 in. by 4 in. by 2 in., comprises a

Everett Edgcumbe "Hum Metrohm"

high-capacity 9-V dry battery with an interrupter (hummer), transformer and high-voltage rectifier to give a voltage of 500 V DC for insulation testing. The same battery also provides the current for low-resistance measurements. In either case, the current taken from the battery is only a few milliampères, so that the cells have an exceptionally long life. Moreover, a fall in battery voltage does not impair the accuracy of measurement and a clear indication is given whenever the battery requires replacement.

The direct reading and exceptionally open scales cover insulation measurements from 100,000 ohms up to 25 megohms and resistance measurements from 1/10th ohm up to 20 ohms. In addition, it is always available for use as a simple detector in tracing out connections or locating faults.

Adjustable Lamp

The "Verona Universa" adjustable lamp made by JABEZ BATE & CO., LTD., Verona Works, Brearley Street, Birmingham, can be fitted with a base ring or clamp making it suitable for innumerable uses, including reading, table or wall lamp; dressing table; darts; sewing machine; typewriter; factory; or A.R.P. purposes. The reflector gives a concentrated light with no glare.

Home Thermostat

The BRITISH THERMOSTAT CO., LTD., Windmill Road, Sunbury-on-Thames, informs us that its "Adaptastat" described in our issue of March 29th (page 374) can safely be used to control 2-kW fires on 250 V as the contacts are of ample size. The ideal size of unit for control by one thermostat, however, is 1 or 1½ kW, and certainly not greater than 2 kW. With larger heating units, unless expert advice concerning the position of the thermostat is available, uneven control is likely to be experienced.

Electric Blanket Switch

A new switch for use on electric heating pads and blankets will be available shortly from ARROW ELECTRIC SWITCHES, LTD., Hanger Lane, Ealing, W.5. The casing of the switch is of moulded bakelite, and interior con-

Arrow blanket switch

nections give double- or single-pole series-parallel, with two off positions.

The unit, which is rated at 2A, 250V, is of special interest at present, as it has a wide application for use on electric pads and blankets in connection with A.R.P. and general hospital work. Hitherto such switches have been imported from the Continent, and this is claimed to be the only entirely British-made unit.

Drilling Apparatus

Two useful pieces of drilling apparatus are announced by the CONSOLIDATED PNEUMATIC TOOL CO., LTD., 232, Dawes Road, London, S.W.6. The "Little Giant" No. 200 combination electric hammer and drill is described by the company as "the most universal tool yet devised." A feature is that the hammering and rotary actions are combined in one operation, controlled by a hand clamp. A rotation lock and snap spring converts the motion to hammering only, thus enabling the tool to be used for chipping, cutting chases, etc.

The detachment of the hammer mechanism, a matter of a few seconds, leaves a lightweight drill, weighing only 6lb., suitable for drilling wood (¼ in. to ⅝ in. holes), metalwork (up to 5/16 in. holes), brickwork, etc.

The other device is a new type of sen-

Left: "Little Giant" combination electric hammer and drill for drilling. Above: A sensitive electric drilling stand

sitive electric drilling stand, of improved design, simplified construction and lighter weight. It accommodates drilling machines from ⅜ to 1⅛ in. capacity, and the rigidity of the design gives smoothness of operation and ensures accurate drilling. The equipment does, in fact, offer all the advantages of a fixed sensitive drilling machine with the additional merit that the electric drill can be quickly removed from the stand and used as a portable tool when required.

A magnetic drill post is also available in two sizes for use on iron or steel where it is reasonably flat, the loading of the magnets being respectively 70 and 100W.

Boiling Ring

The new "Efesca" electric boiling ring made by FALK, STADELMANN & CO., LTD.,

"Efesca" boiling ring

83-93, Farringdon Road, London, E.C.1. can be stood on its side for use as a heater. Its overall dimensions are 9 in. diameter by 4½ in. high, and the loading is 700 W. The vitreous enamelled steel body is finished in mottled grey and has two handles arranged so as to accommodate two utensils. A double base prevents the table being scorched.

Mercury Torch Switch

The new "Legalite" mercury torch switch brought out by L. G. HAWKINS & CO., LTD., 30/35, Drury Lane, Kingsway, London, W.C.2, automatically switches off the light if the torch is pointed upwards. It can be fitted to any standard torch.

COMMERCIAL and INDUSTRIAL NEWS

Iron and Steel Salvage. Electric Vehicles at Leeds. Private Generating Plant

Scrap Iron and Steel

THE need for salvaging every possible ton of scrap iron and steel cannot be emphasised too strongly or too often. Every ton of scrap saved, if converted into ships, gives about ten tons of shipping space per annum. Furthermore, if the metal is not salvaged, it will have to be imported from abroad and so reduce the shipping space available for other essential commodities and food, as well as unnecessarily using up our foreign credit.

The electrical trades can substantially help the steel industry and also themselves by collecting up all waste materials, no matter how small the quantities, by checking over stores and seeing if the tools and fittings on hand are really useful, or are being treasured for a need which may never arise. The more scrap sent for melting the greater the finished steel production and the better chance individual manufacturers have of receiving their requirements.

How great is the hidden reserve of waste metals can be judged by the fact that no less than 100,000 tons was collected as a result of the first appeal made to industrialists recently. The electrical industry must do its share in this contribution to the war effort by the fullest co-operation in this drive. If manufacturers have difficulty in finding buyers, assistance can be obtained from the offices of the Scrap Iron and Steel Campaign, 427, Bush House, W.C.2.

The Minister of Supply has made the Control of Iron and Steel (No. 7) (Scrap) Order, 1940, Direction (No. 3), increasing the maximum prices of scrap iron and steel as from May 6th, to meet the recent increase in railway charges. In the case of scrap iron and steel for the manufacture of steel ingots, otherwise than in electric arc furnaces, the maximum prices have been increased by 1s. 6d. per ton for consumers in South Wales (West); by 1s. per ton for consumers on the North-west Coast, and in Cheshire (including Shotton), Brymbo and South Wales (East); by 6d. per ton for consumers in the Midlands (except for two grades of cast-iron which are increased by 1s. per ton); and by 9d. per ton for consumers in all other districts. All other grades of scrap are also increased by 9d. per ton. Copies of the Direction may be purchased from H.M. Stationery Office, or through any bookseller.

Reserved Occupations

The Ministry of Labour and National Service has issued a revised list of reserved occupations in which six more trades have been added, while the ages in other occupations already in the schedule have been amended. The new entries to the schedule include the following (ages in parentheses):—Asbestos composition goods, including brake and brake linings manufacture (30); electrically propelled goods vehicle drivers (25 and 30). Occupations in which the ages have been amended include plastics and plastic goods manufacture (23); asbestos opening, spinning and weaving (25); asbestos cement goods manufacture (25); galvaniser, tinner (21); brazier (18).

Old Cromptonians

The annual dinner of the Association of "Old Cromptonians" will be held on May 31st at the Savoy Hotel, London, W.C.2. Many distinguished men in industry and electrical science are expected to attend, among them being Sir Andrew Duncan, President of the Board of Trade, who will propose the toast of "The Electrical Industry."

Black-out Factory Lighting

The black-out restrictions may result indirectly in a saving in the cost of electricity for lighting factory premises. This is due to the necessity for improved artificial lighting to make up for the loss of light from darkened windows and the consequent adoption of a system of lighting which has been scientifically planned and is more economical to use. A case in point is the factory of Bill Switchgear, Ltd., at Perry Barr, Birmingham, where not only has the lighting been immensely improved but the electricity bill has been actually halved. Instead of 230 200-W gas-filled lamps, 80-W "Mercra" fluorescent electric-discharge lamps in R.E.A.L. reflectors have been substituted to give an average intensity on the working plane of 7-8 ft. candles. The whole of the work was carried out by the company's own plant engineers.

Electric Vehicle Exhibition

The third of the series of exhibitions organised by the Electric Vehicle Association was held at the Central Garage, The Meadow, Leeds, on May 1st and 2nd. The increased interest in electric vehicles was indicated by the large attendance of both members of the public and representatives of businesses. Exhibitors report a highly satisfactory number of inquiries.

The following companies showed various types of vehicles:—Partridge, Wilson & Co., Ltd. ("Utility" vehicle, Davenset charger, bulldog chassis); Murphy Cars and Trucks, Ltd. ("Servitor" three-wheeler chassis and three-wheeler milk float); Metropolitan-Vickers Electrical Co., Ltd. (7-9 cwt. van, 18-22 cwt. chassis, demonstration controller); Vulcan Motors, Ltd. (2½-ton chassis, 20-cwt. mineral water van); Midland Vehicles, Ltd. (25-cwt. chassis, 12-cwt. van). Batteries were shown by the Chloride Electrical Storage Co., Ltd., the D.P. Battery Co., Ltd., the Tudor Accumulator Co., Ltd., and Young Accumulator Co., Ltd., and a charger was shown by the Westinghouse Brake & Signal Co., Ltd. The next exhibition will be held at McNeil's Garage, 147, Bothwell Street, Glasgow, on May 14th, 15th and 16th.

Electrical vehicle display at Leeds

Industrial Area Organisation

Under the Ministry of Supply's area organisation scheme Advisory Committees have been formed for the Wales, Southampton and Liverpool areas. Among the members of the last-named Committee are Messrs. C. H. Evans (Automatic Telephone & Electric Co., Ltd.), A. C. Livesey (Brookhirst Switchgear, Ltd.), W. S. Roberts (Railway Signal Co., Ltd.), and F. Foulkes (Electrical Trades Union). An Advisory Committee for the Rochester district has also been formed. The members include: Mr. F. N. Headicar, joint secretary of the Engineering and Allied Employers' London and District Association, and Mr. A. Saul, of the Electrical Trades Union.

New E.C.A. Members

At a recent meeting of the Council of the Electrical Contractors' Association (Inc.), the following were elected to full membership:—Fullick & Loosley, Ltd.; Ealing, W.5; G. H. Head, Hanwell, W.7; Reeds Electrical (Southall), Ltd., Southall; Spicer & Co., Southall; V. & D. Keale, Staines. The following were elected to associate membership:—W. J. Pepper. Acton, W.3; Southern Motor Mart, Redhill.

American Appliance Sales

The *Electrical World* reports that a group of electrical appliance dealers who have objected to the promotional sales programme of the Consolidated Edison Co. of New York are seeking an injunction charging conspiracy to violate the anti-trust laws. The Consolidated Edison companies were accused of making unfair use of their "unique power" as monopolies in the utility field against the independent dealers. As between the utilities and defendant manufacturers, the conspiracy was alleged to have taken the form of agreements to pool advertising, good will and sales promotion in the sale of the manufacturers' products in the retail market.

Manchester Radio and Electrical Club

Manchester Radio and Electrical Club, whose seventh annual general meeting was held at Manchester last week, has decided to make its headquarters at the Manchester Engineers' Club. Mr. V. H. C. Moore was elected president; Messrs. E. G. Freeman (Ever Ready), D. Strange (B.B.C.) and S. Jones, vice-presidents; Mr. H. W. Highman, secretary; and Messrs. H. Quarmby, A. C. Butterfield, R. J. Wright, J. A. Roddy, W. Stewart and G. W. Lowe members of the committee. It was decided to vote £10 10s. of the surplus funds to the E.I.B.A. whose good work, especially in the Manchester area, was warmly commended.

Electricity and the National Food Campaign

Under E.D.A. auspices a meeting of members of electrical sales, maintenance and consumers' staffs was held at Wilmslow (Cheshire) on May 9th for a discussion and demonstration of the use of electricity as applied to the National Food Campaign. The meeting was attended by Mr. A. J. Rowntree. liaison officer between the Ministry of Food and the electricity supply concerns.

Trading with the Enemy

The Board of Trade has issued the Trading with the Enemy (Specified Persons) (Amendment) (No. 4) Order (S.R. and O. 567) which supersedes previous Orders and gives the names by countries of a large number of German concerns and agents in all parts of the world with whom commercial transactions are forbidden.

The Paris Fair

Visitors to the International Trade Fair, which opens in Paris on May 11th, will find the British Corner on the central avenue immediately inside the main gates. Three of the principal exhibitors will be the Department of Overseas Trade, the British Chamber of Commerce (Paris) and the F.B.I.

Welfare at Strowger Works

The welfare of its 6,000 employees has always received the special attention of the Automatic Telephone & Electric Co., Ltd., and the work in this connection has assumed such proportions that a new building block devoted solely to welfare work has now been opened in which there is a first-aid room with trained nurses in attendance and offices for the staff who handle the clerical work connected with welfare. The company has a large dining room in which over 1,000 employees sit down every mealtime. Particular attention is paid to safety matters, and both the human and mechanical aspects receive careful consideration.

Training classes in the company's specialised subjects are held by arrangement with the city technical school,

while arrangements have been made with the city transport authorities to aid employees in easy travelling to and from their work. A voluntary holiday fund is run. The company has a scheme of grants to dependants of employees who have joined the Forces, and the personnel contribute to a scheme for providing comforts for those on service. There is A.R.P. accommodation for the whole of the employees and a fully trained A.R.P. organisation. For a number of years the employees have had their sports and social organisation, for which the company purchased Broad Green Hall, a mansion, as a recreational centre for the staff.

"Where to Buy"

In the 1940 edition of "Where to Buy" endeavour has been made to include a reference to every electrical need, and the classified headings (arranged alphabetically) cover almost every conceivable kind of electrical apparatus and material. In addition to the names and addresses of suppliers, their telephone numbers and telegraphic addresses are given. There is also a comprehensive alphabetical list of trade names. The directory is published by "Where To Buy," Ltd., 49, Wellington Street, Strand, London, W.C.2, at 2s. 6d. post free.

Cyprus Tariff Revision

The revised Customs tariff dated April 9th lays down a British preferential duty of 16 per cent. *ad valorem* on electrical goods and apparatus, with a general rate of 24 per cent. The British preferential duty on wireless receiving apparatus and parts is 20 per cent. and the general rate 28 per cent. Such equipment coming from other than British Empire countries (except Canada and Newfoundland) are subject to import licences.

Private v. Public Supply

Private generation of electricity is nowadays something of a novelty in towns, most consumers finding it cheaper and more convenient to take their energy from the public supply. An interesting exception to the rule is to be found at Mr. A. J. Allen's motor garage and service station at Bromley Road, Catford, where last year about 100,000 kWh was generated to cater for all the electrical equipment on the premises which comprises car washers, paint sprayers and exhaust fans; various drills, lathes, cylinder bores, valve refacers, &c.; compressors for pneumatic drills, tyre pumps, &c.; battery chargers and electrical fault finders. Actually the saving in the cost of electricity only is not very impressive, working out at about 30s. a week, but as the exhaust heat from the engines is employed to warm the whole of the premises, the value of the scheme is considerable.

Before the waste heat was utilised Mr. Allen tells us that heating cost him £6 a week for fuel, £3 for a stoker's wages and £1 a month for the removal of cinders and ashes. In computing the savings the wages of the electrician (£5 a week) have been included in the cost, although the plant needs so little attention that he is free for other work practically all the time. Probably £2 a week would be a fairer allocation for his services on the generator plant alone. This would bring the saving up to nearly £4 a week.

The supply is generated at 240 V DC, and the plant used to provide the 100,000 kWh last year comprised a 21-HP Ruston & Hornsby engine driving a 15-kW generator and a 23-HP Crossley engine driving an 18-kW generator. There is also a small convertor for supplying AC to the petrol pumps and for various other purposes. A few months ago, in preparation for anticipated expansion of business, a 72-HP Petter engine driving a 50-kW generator was installed, but owing to the war this is not required at the moment. All the plant, including a very large underground exhaust box, has been erected and installed by Mr. Allen and his staff. The interesting point about the exhaust box is that all the gases are forced through water before entering the chimney. Mr. Allen claims that by the use of this method he is able to minimise the noise and fumes usually associated with these engines. The switchboard also has been constructed on the premises. The apparatus has separate panels for each engine and for the AC supply. All the machines run on a common busbar.

Generating equipment at Mr. A. J. Allen's garage

E.I.B.A. in Sussex

The Sussex Centre of the Electrical Industries Benevolent Association has decided to hold its annual ball as usual this year. The date is May 31st and the place the Grand Hotel, Brighton. Tickets (single 10s. 6d.; double 20s.) can be obtained from the hon. secretary and treasurer, Mr. W. N. C. Clinch, "Electric House," Castle Square, Brighton, the hon. organising secretary, Mr. B. S. H. Warde (Cryselco, Ltd.), 59, Ship Street, Brighton, or members of the Committee.

New M.E.M. Showrooms

The Midland Electric Manufacturing Co., Ltd., announces the opening of new showrooms at 48/50, Chapel Street, Salford. The new premises were opened on May 6th and it is now possible for electrical wholesalers and retailers or their customers to examine the complete range of M.E.M. electric fires, together with the company's well-known switch, fuse and motor control gear.

To assist the industry in these times of national emergency with the attendant transport difficulties, &c., it has been decided to carry a stock of M.E.M. gear and other products for the convenience of wholesalers urgently requiring material.

The new showrooms are in charge of Mr. J. W. Waterhouse who has been the company's representative in Lancashire for a number of years. The telephone number of the new premises is Blackfriars 6929.

Trade Announcement

Marconi-Ekco Instruments, Ltd., has transferred its sales and administration offices to Ridgmont Road, St. Albans, Herts.

Fatal Fall After Shock

An inquest was held at Birmingham last week on James Eccles, aged 30, who received a shock from an electric drill while standing on a ladder and fell to the ground, sustaining fatal injuries. Mr. F. Gyford, an electrical foreman, said he had been given to understand that Eccles had made a temporary connection. Examining the drill and connecting wires in court, he said the earth was connected to neutral. There was no independent earth. Mr. F. H. Mann, H.M. Inspector of Factories, stated that the drill was satisfactory; the error was in the "heinous method of connection." Medical evidence showed that death was due to a fractured base of the skull received in the fall. Recording a verdict of "Accidental death," the Coroner said there was no doubt that the drill Eccles was operating was "alive." It was reasonable to conclude that he had made an error in connecting the leads to the machine.

Prices of Materials

The only change in the prices of materials since April 24th of which we have been notified is the following:—Messrs. Henry Gardner & Co., Ltd., report, May 8th: English block tin £255 5s., £1 15s. increase.

Compensation Claim

Mrs. Ada Lewis, of James Street, Oswaldtwistle, sued H. J. Cash & Co., electrical and heating engineers, Manchester, at Manchester Assizes, on May 3rd, for the loss of her husband. It was stated that Lewis was engaged at Messrs. Phillips' factory at Blackburn, last October, when he fell 10 ft. from a manifold, which was afterwards found to be loose. The defence was that Lewis had no right to sit on the manifold, which was obviously incomplete.

When the case again came before the Judge on May 6th, he awarded £676 and costs, including £100 for plaintiff's son.

New Catalogues and Lists

L. G. Hawkins & Co., Ltd., 30-35, Drury Lane, London, W.C.2.—Particulars of a new cylindrical model cleaner for export.

E. K. Cole, Ltd., Southend-on-Sea.—The April number of the "Thermovent News" contains articles on air circulation, and controlling cost and comfort in space heating.

George Cohen, Sons & Co., Ltd., Wood Lane, Shepherd's Bush, W.12.—A folder relating to seamless "Latex" protective rubber gloves, aprons, &c.

Hotpoint Electric Appliance Co., Ltd., 24, Newman Street, W.1.—Details of price variations which came into operation on May 1st.

Engineering & Lighting Equipment Co., Ltd., Sphere Works, St. Albans.—A 28-page illustrated catalogue of industrial lighting equipment with details of several new fittings.

Marconi-Ekco Instruments, Ltd., Electra House, Victoria Embankment, W.C.2.—Leaflets describing two new instruments, the TF.517 ultra-high-frequency signal generator and the TF.643 ultra-high-frequency wavemeter.

Power Appliances, 68, London Road, North Cheam, Surrey.—A leaflet giving particulars of the "Lectrimower" electric lawn mower and the "Lectrimo" convertor for use on an ordinary hand mower.

Gaston E. Marbaix, Ltd., 22, Carlisle Place, London, S.W.1.—A leaflet relating to the new "Tauco" 14-in. metal cutting band-saws.

Davidson & Co., Ltd., Sirocco Engineering Works, Belfast.—Publication SF.310 dealing with "Sirocco" axial flow compressed-air driven fans.

Scott Insulated Wire Co., Ltd., Queensland Works, Westmoreland Road, London, N.W.9.—A card indicating the physical properties of "Manganamron" copper-nickel-manganese wires, which are especially suitable for the manufacture of precision instruments, shunts, &c. Also a card giving useful data regarding the company's principal products.

INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, &c., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the following:—

"ANDERTON'S" patent disc type friction clutch.

Ironclad emergency switch, Yale key type, 400 V, 1 A.

ELECTRICITY SUPPLY

Success of Belfast Demonstrations. Stopping Competition at Shipley

Ayr.—Rural Electrification. — Proposals for the introduction of a system of rural electrification for Ayrshire put forward by the Ayr Area Executive Committee have recently been discussed by the War Committee. This Committee, states the *North British Agriculturist* (Edinburgh), felt that representations might appropriately be made for the promotion of such a scheme for the whole of Scotland. Having regard to the increased agricultural production which was called for during the war and the serious labour problems confronting farmers, it considered that any scheme which would bring an electricity supply within the reach of agricultural districts would be of the greatest advantage to the country as a whole. These points have been brought before the Department of Agriculture for Scotland.

Belfast.—Cookery Demonstrations.—The Corporation is assisting in the National Food Campaign by giving weekly demonstrations in wartime cooking at its central showrooms, Wellington Place. Attendance at these demonstrations is exceptionally good and arrangements had to be made to enlarge the seating capacity of the demonstration hall. A direct result of these demonstrations has been an increase in the demand for cookers and water-heating equipment, which are still being hired at pre-war rentals.

Cardiff.—Loans for Equipment.—Permission has been obtained by the Electricity Committee to borrow £8,000 for meters and £16,000 for consumers' apparatus.

Chester. — Distribution Developments.—Plans have been approved by the Electricity Committee for a number of supply extensions, including overhead lines to Hatton, Brassey Green, Capenhurst and Stapleford, and underground cables at Ring Road, Piper's Ash, Hoole, Whipcord Lane and Neville Road. It is also proposed to replace a high-voltage overhead line at Blacon by underground cables, with a new substation, provide a new substation and overhead line at Balderton, and obtain three sets of surge absorbers. The estimated cost of the proposals is £5,816.

Cornwall.—Bill Now Unopposed.—The Cornwall Electric Power Bill, which confers further powers on the Cornwall Electric Power Co., has now been referred to the Unopposed Bills Committee. There was originally opposition from a number of local authorities in the county, but this was withdrawn on an undertaking by the Company to insert a suitable clause safeguarding the interests of consumers.

Coventry.—Cost of Substation Site.—A decision of the Electricity Committee to accept an offer of a piece of land for a substation at a price of £450 was commented on by Alderman W. E. Halliwell, at last week's meeting of the City Council. He said that the price worked out at £350 per acre for back land just outside the city boundary, and asked whether it was true that the land had originally been bought at £80 per acre. Councillor H. Weston also inquired whether the land was not extremely boggy. Councillor B. H. Gardner, chairman of the Electricity Committee, said that some of the facts had come to the notice of the Committee after it had reached its decision. The district valuer had taken some exception to the price, and as a result the matter was being reconsidered in all its aspects.

Eccles. — Factory Electrification Scheme.—The electrical engineer has reported on negotiations with Hazlewood & Sons, Ltd., regarding a proposal to replace steam engines at Nelson Works, Patricroft, by electric motors. He has submitted a scheme for the complete electrification of the works, which would necessitate the provision of a cable and maximum demand indicator at a cost of £84. The Electricity Committee has agreed to proceed with the work and to arrange for the provision of motors on hire purchase, the initial cost of which to the Corporation would be £360.

Another industrial project which has been approved is the provision of an increased supply to the Carlisle Electrical Manufacturing Co., Ltd., at a cost of £1,087 for cable and substation equipment. The Electricity Committee is, furthermore, to supplement the high-voltage supply in the Patricroft and Monton districts at a cost of £540.

Sanction has been obtained to borrow £1,268 for substations and £1,600 for mains and services.

Enfield. — Installations in A.R.P. Posts.—The Emergency Committee has prepared a scheme for the installation of electricity at various A.R.P. posts at a cost of £596.

Eston.—Electrical Installation Work.—Consideration has recently been given by the Electricity Committee to the procedure to be adopted with outstanding applications for wiring at consumers' premises. The electrical engineer has been authorised to proceed with such installations and defray the cost out of surplus revenue.

Siren Tariff.—The Committee has decided that payment for electricity supplied for air-raid warning sirens shall be at the rate of 5s. per siren per annum, with an additional charge of £1 12s. 6d. per quarter for the maintenance and servicing of the equipment.

Farnham.—Opposition Withdrawn.—The Petersfield R.D.C. is withdrawing its opposition to the Parliamentary Bill being promoted by the Farnham Gas and Electricity Co., many concessions having been obtained.

Glasgow.—Distribution Extensions.—The Electricity Committee has agreed that distributing mains shall be laid at a cost of £2,532.

Grampians.—Fire at Substation.—Three transformers, automatic change-over gear, and the main Tummel Bridge, Arbroath, overhead feeder, were damaged by a fire at the Gatehouse substation of the Grampian Electricity Supply Co., near Pitlochry, Perthshire, on May 4th. Alternative connections being available, there was little interruption of the supply.

Huddersfield. — Mains Development Scheme.—The borough electrical engineer has submitted plans for laying additional lengths of 6,600-V cable from the electricity works to Newsome Road; electricity works to showroom; Milnsbridge to Longwood; and Lockwood to Park Road, Crosland Moor.

Hull.—Loans Sanctioned.—The Electricity Committee has obtained sanction to borrow £5,000 for meters and £1,513 for mains.

Huntingdon.—Water Pumping Scheme.—The Rural District Council is applying for sanction to borrow £5,360 for the construction of a duplicate water pumping station and other works to provide an alternative supply in case of enemy attack on the main station.

Keswick.—Change-over.—In reply to a letter from the U.D.C. complaining of delay by the Keswick Electric Light Co. in changing-over the electricity supply the Electricity Commissioners have stated that the matter is outside their jurisdiction and in the present emergency conditions nothing further can be done about it. The Council has decided to write further to the Commissioners.

Kingston. — Proposed New Power Station.—At the first meeting of the Board set up in connection with the Hogsmill Valley drainage scheme, it was stated that the present site of the Kingston sewage works as well as that of the adjoining power station would probably be required for a new selected station to be built by Kingston Corporation under the South East England Electricity Scheme, 1939, at a cost of about £1,500,000.

Leicester. — Street Lighting. — The City Council has agreed to adopt a system of street lighting for the city. The original estimate of the cost was £7,595, but recent increases will probably raise this figure by £1,000.

London.—Traders Complain.—A petition signed by nearly a hundred Mayfair traders complaining against the new charges and contracts of Central London Electricity, Ltd., was presented to the Minister of Transport this week.

Mansfield. — New Substations. — The Electricity Committee is to provide an additional substation in Leeming Lane at a cost of £953, and another in Black Scotch Lane (£156). It has obtained sanction to borrow £1,514 for mains.

Morecambe and Heysham.—Rate Contribution.—A sum of £4,000 is being transferred from the electricity undertaking to the relief of the town rates. Originally it was intended that the undertaking should provide £5,000.

Ossett.—Purchase of Undertaking.—The Corporation is taking steps to obtain an extension of the period for purchase of the local electricity undertaking from the Electrical Distribution of Yorkshire, Ltd., in view of the Government's desire to limit the raising of capital.

Plymouth.—Additional Cable.—Application is to be made by the Corporation for permission to borrow £1,090 for an additional main from the Prince Rock generating station to the city boundary in order to supply the Plymstock area of the Plympton Rural District Council.

Rotherham.—New Feeder.—The electrical engineer has reported that the pro-

(*Continued on page* 530.)

War Effects in Northern Ireland

PRIOR to the outbreak of war sales development in the area of the Electricity Board for Northern Ireland had considerably accelerated. The Board's report for last year shows that in the first nine months the rate of expansion was 14.8 per cent., compared with 4.6 per cent. in the same period of 1938. The effect of the war, however, was such that in the fourth quarter the increase dropped to 1.2 per cent. against 8.2 per cent. in 1938. Even so, the total sales (46.6 million kWh) represent an improvement for the complete year of 11.0 per cent., which compares very favourably with the 5.7 per cent. advance in 1938. The number of consumers increased from 39,530 to 41,358.

Shortly after the outbreak of hostilities hire schemes were withdrawn except in respect of cookers and wash boilers; existing agreements were, however, not interfered with. A bright aspect of the Board's operations was the steady increase in supplies for power purposes which continued throughout the year, an interesting feature of this development being the establishment of a new tannery in disused premises at Shrigley, where the availability of an abundant supply of electricity at a low rate was an important factor.

Another consequence of present conditions is the interconnection of the high-voltage systems of the Board and the Antrim Electricity Supply Co. This will enable emergency supplies up to 6,000 kVA to be given should the sources of supply of either the Board or the Company be put out of action. At the end of the year there were connected to the Board's system 563 miles of 33-kV, 125 miles of 11-kV and 35 miles of 6.6-kV lines. The total length of distribution mains was 517 miles, and the number of transformers was 421.

By effecting economies wherever possible, expenditure was kept down as low as possible. Nevertheless, tariff increases were inevitable, but Mr. Lendrick McMaster, the Board's secretary, says it is hoped that these will be only of a temporary nature. For the year revenue income amounted to £316,465 against £289,758 in 1938, expenditure rising from £166,589 to £173,917. After allowing for interest and other charges there was a surplus of £424 which has been added to the credit blance of £4,734 brought forward from 1938.

NEW PATENTS

Electrical Specifications Recently Published

Compiled by a firm of chartered patent agents. The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1938

7051. "Air-space insulated high-frequency cables." Norddeutsche Kabelwerke Akt.-Ges. March 8th, 1937. (Cognate application 7052/38.) (520023.)

19524. "Thermionic amplifiers." C. A. Laws and H. K. Robin. July 1st, 1938. (520073.)

19776. "Means for converting polyphase current into single-phase current of lower frequency." Allmänna Svenska Elektriska Aktiebolaget. July 9th, 1937. (519925.)

19798. "Method of and means for reducing disturbances in wireless reception." K. H. Meier. July 4th, 1938. (519974.)

23345. "Teleprinters." M. Compare. August 8th, 1938. (520027.)

23500. "Thermostatically controlled electric switch." Metals & Controls Corporation. August 9th, 1937. (Cognate application 23501/38.) (519976.)

23565. "Wired radio service system." Wired Radio, Inc. August 28th, 1937. (520074.)

23648. "Thermionic valve apparatus." R. L. Fortescue. August 10th, 1938. (Addition to 504196.) (520075.)

23661. "Electric socket - contacts." Ward & Goldstone, Ltd., and E. Yearsley. August 11th, 1938. (520028.)

26164. "Presses for moulding plastic material." General Electric Co., Ltd., and R. J. Kaula. September 7th, 1938. (519878.)

26614. "Spotlights or projectors." G. Riccomagno. September 12th, 1938. (Convention date not granted.) (520079.)

28680. "Ovens and like furnaces." J. MacDonald and G.W.B. Electric Furnaces, Ltd. October 3rd, 1938. (520031.)

28894. "Control gear for electrically propelled vehicles." English Electric Co., Ltd., and P. L. Mardis. October 5th, 1938. (Cognate application 34580/38.) (519887.)

28986. "Polyphase watt-hour meter construction." Sangamo-Weston, Ltd. February 10th, 1938. (519893.)

29029. "Saw-tooth wave-generator circuit arrangements." Marconi's Wireless Telegraph Co., Ltd., D. J. Fewings, and R. J. Kemp. October 6th, 1938. (519897.)

29030. "Navigation-aiding directional radio receiving installations." Marconi's Wireless Telegraph Co., Ltd., S. B. Smith and I. S. Forbes. October 6th, 1938. (520081.)

29035. "Electrically heated vulcanising machines for repairing motor vehicle tyres and for other purposes." R. Dupont. May 7th, 1938. (519944.)

29051. "Conductive coatings employed in electron-discharge devices." R. Puleston. October 7th, 1938. (519983.)

29127. "Television receivers." Kolster-Brandes, Ltd., and W. A. Beatty. October 7th, 1938. (520082.)

29128. "Electron-discharge devices." Kolster-Brandes, Ltd., and C. N. Smyth. October 7th, 1938. (519904.)

29129. "Dry-contact electric rectifiers and the manufacture thereof." Standard Telephones & Cables, Ltd. October 7th, 1937. (Cognate application 29130/38.) (519987.)

29260. "Charging plants for electric accumulators." H. Wooldridge. October 10th, 1938. (519991.)

29261/2. "Portable electric lamps." H. Wooldridge. October 10th, 1938. (519992/3.)

29425. "Multi-voltage radio receivers." A. A. Thornton (Philco Radio & Television Corporation). October 11th, 1938. (520036.)

29426. "Photographic photo-electric exposure meters." Metrawatt Akt.-Ges. Fabrik Elektrischer Messgerate. October 11th, 1937. (520037.)

29458. "Submersible motor assembly." Byron Jackson Co. December 8th, 1937. (520040.)

29459. "Thermionic valves." Standard Telephones & Cables, Ltd., and W. T. Gibson. October 11th, 1938. (520041.)

29532. "Telecommunication exchange systems." Standard Telephones & Cables, Ltd., E. P. G. Wright, and F. H. Bray. October 12th, 1938. (520090.)

29562. "Sparking coils." British Thomson-Houston Co., Ltd. October 13th, 1937. (520091.)

29658. Machines for manufacturing filament supports and inserting them into stems for electric incandescent lamps and the like. Aktiebolaget Hammarbylampen. October 16th, 1937. (519952.)

30028. Electric measuring instruments. English Electric Co., Ltd., G. Tilstone, and J. F. Donelly. October 17th, 1938. (520048.)

30545. Apparatus for producing a high-velocity beam of ions. Allgemeine Elektricitäts Ges. October 21st, 1937. (520055.)

30567. Electrical alarm for indicating failure of a supply current. S. Wray. October 22nd, 1938. (519953.)

30628. Electric light fittings. K. S. Adie. October 24th, 1938. (520056.)

30692. Method of marking rubber covered electrical conductors. Callender's Cable & Construction Co., Ltd., J. Bowyer, and J. Taylor. October 24th, 1938. (520057.)

30772. Electrically heated bed-warmers or airers. J. Bee. October 25th, 1938. (519962.)

30814. Luminescent materials. General Electric Co., Ltd., and A. H. McKeag. October 25th, 1938. (519964.)

30872. Inductive-heating devices. D. Pisarev. October 27th, 1937. (519966.)

30949. "Electric-discharge lamps." British Thomson-Houston Co., Ltd., and General Electric Co., Ltd. (H. J. Spanner). October 26th, 1938. (520100.)

30978. Synchronous dynamo-electric machines. British Thomson-Houston Co., Ltd. October 28th, 1937. (520102.)

31002. Electrical plug sockets. G. David and H. Zeddies (trading as Kleinmann, Geb.). October 26th, 1937. (520105.)

31016. Television and like transmitting cathode-ray tubes. Marconi's Wireless Telegraph Co., Ltd. October 26th, 1937. (520106.)

31112. Lighting fittings. British Thomson-Houston Co., Ltd., R. Maxted, and F. K. Garry. October 27th, 1938. (520114.)

31156. Electron multipliers. Marconi's Wireless Telegraph Co., Ltd. October 30th, 1937. (520117.)

31168. Voltage regulators employing on load tap-changing switchgear. Ferranti, Ltd., and G. L. Porter. October 28th, 1938. (520119.)

35164. Asymmetrical resistance. Standard Telephones & Cables, Ltd. December 4th, 1937. (520005.)

35963. Metal base for electric-discharge tubes. Egyesult Izzolampa Villamossagi R.T. December 9th, 1937. (520062.)

1939

8844. Plug-in connectors for use in connecting domestic and other apparatus to mains supply. Hassid, Austin & Co., Ltd., and F. S. Bruce. March 20th, 1939. (520015.)

10695. Electric pressure-detectors. W. Meacher. April 6th, 1939. (519919.)

23286. Apparatus for masking electric lamps and other lighting means. A. Gautier. January 26th, 1939. (519972.)

Electricity Supply (*Concluded*)

posed installation of additional plant at a works in the area makes it necessary to provide an additional feeder and ancillary gear costing approximately £8,000. He has been authorised to proceed with the scheme and seek sanction for the requisite loan.

Sheffield.—MAINS EXTENSIONS. — The Electricity Committee is to extend mains at a cost of £10,940 and erect a substation in Mather Street at a cost of £825.

Shipley.—ELIMINATION OF COMPETITION.—At last week's meeting of the Urban District Council, the chairman of the Electricity Committee (Councillor J. Dibb) expressed satisfaction that the chairman of the Gas Committee (Councillor A. W. Robson) had been appointed vice-chairman of the Electricity Committee. If this had been done some years ago he was sure that the deficit now facing the gasworks would not have been so large. Competition between the two services would be eliminated and he hoped that both undertakings would operate more successfully.

South Shields. — STREET LIGHTING TERMS AGREED.—The Town Council has agreed to an offer by the North-Eastern Electric Supply Co., Ltd., to accept 25 per cent. of the normal street lighting charges during the black-out period. The Company previously asked for 50 per cent.

BULK SUPPLY CHARGES.—It has been reported to the Town Council that the Northern Centre of the I.M.E.A. has considered the suggestion that the technical and financial experts appointed by the Association to consider the charges of the North-Eastern Electric Supply Co., Ltd., for bulk supplies of electricity to smaller undertakings should also consider this matter so far as it affects the larger undertakings. The Association referred the question to a sub-committee which has decided to instruct the experts when necessary.

Thornton Cleveleys. — BULK SUPPLY ARRANGEMENTS.—Blackpool Corporation's agreement with Thornton Cleveleys Council concerning a bulk supply of electricity, which shortly terminates, is not likely to be renewed. It is officially recommended that the agreement between the two authorities should terminate on the payment of a sum of money and other conditions to be subsequently determined. Thornton Cleveleys Council wishes to get its supply direct from Preston.

Tunbridge Wells.—CHARGES INCREASED. —The Town Council has decided to increase the electricity charges from 4½d. to 5½d., 4d. to 5d., and 1d. to 1¼d.

Tynemouth.—MAXIMUM RATE CONTRIBUTION.—The Town Council has decided that the maximum sum permitted by the Electricity Supply Act shall be transferred to the relief of rates from the electricity account.

Wimbledon.—LOAN FOR SUBSTATION.— The Electricity Committee has obtained sanction to borrow £1,250 for the provision of a substation at Southside House.

TRANSPORT

Belgium.—ELECTRIFICATION SCHEME.— Aided by Government grants, the National Railways are steadily extending the electrification of their lines. The latest project covers the line between Brussels and Charleroi, the estimated total expenditure on which is 250 million francs. It is reported that an agreement has been reached regarding a plan for the gradual electrification of other lines radiating from Brussels to nearby cities.

France.—USE OF TROLLEY-BUSES.—A writer in *Le Génie Civil*, points out that only six trolley-bus services were in operation in the country at the begining of the present year. New services are, however, being started in Poitiers and Bordeaux. In the French colonies in Northern Africa greater progress has been made, services of trolley-buses being in operation in Algiers, Tunis, Casablanca, Constantine and Oran.

London.—CENTRAL LINE RECONSTRUCTION.—Begun three and a half years ago, the reconstruction of the London Passenger Transport Board's Central line has been nearly finished, states *Modern Transport*. Owing to the fact that it was built with a central current rail and running rail return, whereas the Board's other lines operate on the third and fourth rail system, with the positive rail outside, special stock was necessary. In connection with the conversion more than ten miles of track has been replaced.

FINANCIAL SECTION

New Companies. Capital Returns. Debenture Charges. Bankruptcies and Liquidations. Reports and Dividends. Stocks and Shares

New Companies Registered

R. B. Page & Co., Ltd.—Private company. Registered April 30th. Capital, £1,000. Objects: To carry on the business of electrical engineers and general electrical installation contractors, lighting specialists and contractors, radio and mechanical engineers, &c. Permanent directors: R. B. Page, 8, Woodlands Road, Surbiton; and E. G. Warren, "Lilamani," Beech Walk, Ewell.

Walter Instruments, Ltd.—Private company. Registered May 3rd. Capital, £1,000. Objects: To carry on the business of manufacturers of and dealers in electrical and other instruments of all descriptions, engineers, founders, electricians, manufacturers of and dealers in glass, erinoid, bakelite and metallic articles, &c. Directors: C. J. Armstrong, 6, Floriston Court, Whitton Avenue, Northolt Park, Greenford, Middx., and J. E. G. Noad, 97, Braund Avenue, Greenford. Registered office: 232, Acton Lane, Chiswick, W.4.

Lindars Electrical Contractors (Oxford), Ltd.—Private company. Registered May 2nd. Capital, £1,000. Objects: To acquire the business of an electrical engineer and contractor carried on by Wm. J. Lindars at 2, St. Michaels Street, Oxford. The subscribers are: Wm. J. Lindars, 2, St. Michaels Street, Oxford; and Mrs. M. J. Lindars, 210, Woodstock Road, Oxford. Solicitors: W. G. and V. Willis, Leighton Buzzard.

Rogers for Radio, Ltd.—Private company. Registered May 2nd. Capital, £1,000. Objects: To acquire the business of a radio and electrical engineer now carried on by Ernest L. Rogers at 74, North Street, Guildford, as "Rogers for Radio." Permanent directors: E. L. Rogers and J. G. Rogers, both of "Bel Respiro," Orchard Road, Burpham, Guildford, Surrey. Registered office: 74, North Street, Guildford.

Gatenby's, Ltd.—Private company. Registered May 2nd. Capital, £600. Objects: To acquire the business of a radio and electrical engineer carried on by Ernest E. Gatenby, &c. Directors: E. E. Gatenby and Mrs. G. A. Gatenby, both of 63, Victoria Road, Ruislip, Middx. Registered office: 63, Victoria Road, Ruislip.

Deflector Grille & Engineering, Ltd.—Private company. Registered April 29th. Capital, £300. Objects: To carry on the business of mechanical, heating, ventilating, air-conditioning and electrical engineers, &c. Directors: R. A. Baring-Gould, "Hilton," Walton-on-Thames, Surrey; and H. J. Sharp, 22, Hill Court, St. Mark's Hill, Surbiton. Secretary: R. A. Baring-Gould. Solicitors: Wm. Sturges & Co., Caxton House, Westminster, S.W.1.

A. T. Petty & Co., Ltd.—Private company. Registered April 30th. Capital, £2,000. Objects: To acquire the business of an electrical engineer and radio and cycle dealer carried on by A. T. Petty at Pudsey and Stanningley, near Leeds, as A. T. Petty & Co. Directors: A. T. Petty, "Greenways," Beechwood Estate, Horsforth, near Leeds (permanent governing director); and G. H. Viney, 49, Alexandra Road, Pudsey, near Leeds. Solicitors: Wormald Catlow & Armitage, 10, Park Row, Leeds.

Companies' Returns

Statements of Capital

British Electrical Export Co., Ltd.—Capital, £2,000 in £1 shares. Return dated July 24th, 1939 (filed February 19th, 1940). 198 shares taken up. £198 paid. Mortgages and charges, nil.

United River Plate Telephone Co., Ltd.—Capital, £10,000,000 in £1 shares (7,800,000 ordinary, 1,800,000 preference and 400,000 unissued). Return dated July 28th, 1939 (filed March 28th, 1940). 7,800,000 ordinary and 1,800,000 preference shares taken up. £9,520,000 paid on 7,720,000 ordinary and 1,800,000 preference. £80,000 considered as paid on 80,000 ordinary. Mortgages and charges, £6,105,894.

Electric Sign Co., Ltd.—Capital, £5,000 in £1 shares. Return dated November 24th, 1939 (filed February 10th, 1940). All shares taken up. £1,000 paid. £4,000 considered as paid. Mortgages and charges, nil.

Taylor, Whiting & Taylor, Ltd.—Capital, £4,000 in £1 shares. Return dated November 1st, 1939 (filed January 30th, 1940). 3,962 shares taken up. £2 paid. £3,960 considered as paid. Mortgages and charges, nil.

Erimus Electrical Factors, Ltd.—Capital, £500 in £1 shares. Return dated October 12th, 1939 (filed February 21st, 1940). 375 shares taken up. £375 paid. Mortgages and charges nil.

Birmingham Electric Furnaces, Ltd.—Capital, £1,000 in £1 shares. Return dated January 2nd, 1940. All shares taken up. £1,000 paid. Mortgages and charges nil.

Durrington Electric Light Co., Ltd.—Capital, £3,500 in £1 shares. Return dated April 10th, 1939 (filed February 23rd, 1940). 3,340 shares taken up. £3,340 paid. Mortgages and charges, nil.

J. & F. Stone Lighting & Radio, Ltd.—Capital, £600,000 in 200,000 preference shares of £1 and 1,600,000 ordinary shares of 5s. Return dated December 14th, 1939 (filed February 15th, 1940). 186,865 preference and 1,600,000 ordinary shares taken up. £469.365 paid on 186,865 preference and 1,130,000 ordinary shares. £117,500 considered as paid on 470,000 ordinary shares. Mortgages and charges, nil.

Hornby Electrical Supplies Co., Ltd.—Capital, £20,000 in 15,000 preference shares of £1 and 100,000 deferred shares of 1s. Return dated January 11th, 1940. 1,100 preference and 26,000 deferred shares taken up. £2,400 paid. Mortgages and charges, nil.

Power Centre Co., Ltd.—Capital, £5,000 in £1 shares. Return dated December 15th, 1939 (filed March 20th, 1940). 3,614 shares taken up. £2,114 paid. £1,500 considered as paid. Mortgages and charges, £1,000.

Burke & Co., Ltd.—Capital, £1,000 in £1 shares. Return dated May 2nd, 1939 (filed February 13th, 1940). All shares taken up. £2 paid. £998 considered as paid. Mortgages and charges, £100.

Autocar Electrical Equipment Co., Ltd.—Capital, £5,000 in £1 shares. Return dated December 18th, 1939 (filed February 9th, 1940). 4,002 shares taken up. £4,002 paid. Mortgages and charges: £2,000.

Vandervell Electric (London), Ltd.—Capital. £100 in £1 shares. Return dated December 31st, 1939 (filed March 8th, 1940). All shares taken up. £100 paid. Mortgages and charges, nil.

Hailwood & Ackroyd, Ltd.—Capital, £25,000 in 3,200 preference and 1,800 deferred shares of £5 each. Return dated January 1st, 1940. All shares taken up. £15,500 paid on 3,100 preference. £9,500 considered as paid on 100 preference and 1,800 deferred. Mortgages and charges: £46,800.

D. L. Topps, Ltd.—Capital, £1,000 in 1,000 ordinary shares of £1. Return dated December 30th, 1939. 900 shares taken up. £900 paid. Mortgages and charges, nil.

Suflex, Ltd.—Capital, £3,000 in £1 shares. Return dated December 26th, 1939 (filed February 23rd, 1940). All shares taken up. £3,000 paid. Mortgages and charges, nil.

Peerless Electrical Manufacturing Co., Ltd.—Capital, £50,000 in 46,500 ordinary shares of £1 and 70,000 deferred ordinary shares of 1s. Return dated December 28th, 1939. 37,500 ordinary and 43,368 deferred shares taken up. £37,986 10s. paid on 36,000 ordinary and 45,368 deferred ordinary shares, leaving £371 18s. calls unpaid. £1,650 considered as paid on 1,500 ordinary and 3,000 deferred ordinary shares. Mortgages and charges, £39,546 10s.

Increases of Capital

Aberdare Cables, Ltd.—The nominal capital has been increased by the addition of £250,000, in £1 shares, beyond the registered capital of £250,000. To March 26th, 1940, 250,000 shares had been issued and fully paid up in cash. The shareholders included C.M.W. Trust, Ltd. (20,000 shares); County of London Electric Supply Co., Ltd. (17,250); International Combustion, Ltd. (22,500); Midland Bank (Princes Street) Nominees, Ltd. (12,650); R. F. Nominees, Ltd. (48,998); and Geo. C. Usher (24,675).

Aberdare Cables (Overseas), Ltd.—The nominal capital has been increased by the addition of £9,000 in £1 ordinary shares beyond the registered capital of £1,000. The above increase is for the purpose of acquiring that part of the undertaking of Aberdare Cables, Ltd., relating to the business carried on in South Africa, Australia and India.

C. E. E. Co., Ltd.—The nominal capital has been increased by the addition of £1,000 beyond the registered capital of £1,000. The additional capital is divided into 1,000 unclassified shares of £1.

Mortgages and Charges

Sordoviso Switchgear, Ltd. — Mortgage on uncalled capital, dated April 22nd, 1940, to secure £500. Holder: E. S. De Beer, 11, Sussex Place, Regent's Park, N.W.

Simmonds and Stokes, Ltd.—Particulars filed of (a) first series of third debentures to secure £2,000 and (b) second series of third debentures to secure £950. authorised February 21st, 1940, charged on the company's undertaking and property, present and future, including uncalled capital, the whole amounts being now issued.

Bylock Electric, Ltd.—Particulars filed of £4,000 debentures, authorised April 17th, 1940, charged on the company's undertaking and property, present and future, including uncalled capital (subject to mortgage on Bylock Hall, 109, South Street, Ponders End, dated November 5th, 1937), the whole amount being now issued, and ranking in priority to debenture dated January 9th, 1936.

Petition Dismissed

Agricultural, Constructional and Electrical Utilities, Ltd.—In the Companies' Court on May 6th Mr. Justice Simonds had again before him the petition for the compulsory winding-up of this company. Mr. Gedge, for the petitioners, and the supporting creditors, said it had been agreed that the petition should be dismissed without costs. His Lordship therefore dismissed the petition with no order as to costs.

Winding-up Order

Charlton Electrical Co., Ltd.—In the Companies' Court on April 29th Mr. Justice Crossman made a compulsory order for the winding-up of this company upon the petition of Messrs. Brown Bros., Ltd., judgment creditors for £211. The petition was opposed.

Bankruptcy Proceedings

E. N. Belsten, 245, Highters Heath Lane, Warstock, Birmingham, electrical contractor.—This debtor's public examination took place at the Court House, Corporation Street, Birmingham, 4, on May 1st, and was provisionally closed. The statement of affairs showed gross liabilities of £4,663, of which £554 was expected to rank for dividend, and there was a deficiency of £318. Debtor said that the outbreak of war had caused supplies to be restricted, and as a result he had lost several contracts.

Company Liquidations

North London Electric & Radio, Ltd.—Winding up voluntarily. Liquidator, Mr. C. Latham, 185-188, High Holborn, London, W.C.1.

Kniveton Cable Works, Ltd.—Meetings of members and creditors, pursuant to Section 245 of the Companies' Act, 1929, at 3, Frederick's Place, Old Jewry, London, E.C.2, to receive an account of the winding-up by the liquidator, Mr. T. Howarth.

Reports and Dividends

The Calcutta Electric Supply Corporation, Ltd.—At the annual meeting held on May 6th Lord Meston (chairman) said that the outbreak of war had affected their business in various ways, but the year had been one of steady progress. Domestic electricity consumption rose by nearly 6 per cent. and power consumption by over 8 per cent. Owing to the important concession in charges introduced in 1938, however, trading receipts increased by only 3 per cent. The domestic demand was slowing down and so far many electrical appliances, especially cookers, had not yet been adapted to Hindu requirements. In the industrial department jute was the controlling factor, and owing to the war contracts their peak load ran up to over 140,000 kW as compared with a previous highest of 112,000 kW.

The new super station at Mulajore had been brought into commission and the first 30,000-kW set was started on October 7th. The station was formally opened by the Governor of Bengal in January.

The Ever Ready Trust Co., Ltd.—Presiding at the annual meeting held on May 2nd Mr. Magnus Goodfellow (chairman and managing director), said that their policy of investing the bulk of their funds in equity stocks in large manufacturing businesses at home and in primary commodity businesses throughout the Empire, had so far proved sound, and they hoped that the continuation of this policy would stand them in good stead in the future. A number of their investments had shown improved results during the past year and this, together with the announcement by the Ever Ready Co. (Gt. Britain), Ltd., of a record year's working, led them to hope for a still further improvement in their income during the coming year, if the operations of war did not interfere.

The Telegraph Condenser Co., Ltd.—Presiding at the annual meeting on April 30th Mr. S. G. Brown (chairman and managing director) said that the profit on trading for the year amounted to £30,813, as against a loss of £8,094 in the previous year. It was proposed to pay the dividend due on the 6 per cent. cumulative preference shares for the half-year ended December 31st, 1938, and provided nothing untoward happened the company should be in a position to pay a regular half-yearly preference dividend and possibly to improve the position with regard to arrears of dividend.

The output of the factory had been considerably increased and works and selling expenditure had been reduced without impairing efficiency in any way. In addition, the order book was more satisfactorily filled with all classes of work than at any other time in the history of the company.

The Madras Electric Tramways (1904), Ltd.—At the annual meeting on May 1st Mr. K. A. Scott Moncrieff (chairman) said that the loss of £2,027 for the year was due to circumstances beyond their control. The diminution in traffic receipts was 14.7 per cent. and in passengers carried 15.9 per cent. as compared with 1938. They could not conceive why the Government and Corporation of Madras considered it necessary to close the Stanley Viaduct against tramway traffic and yet sanction other classes of transport. When the Congress Party came into power in 1938, the Mayor of Madras gave notice of his intention to municipalise the public utility companies and an *ad hoc* committee of the Corporation was formed which resulted in instructions to the city engineer to prepare a scheme for a centralised bus service—presumably because it was discovered that the tramway undertaking could not be acquired until 1955.

They had fulfilled their obligations in a liberal spirit, and were, therefore, entitled to expect more sympathetic treatment from the authorities. If it was the serious desire of the authorities to acquire the undertaking before 1955, they were ready to discuss terms, and this procedure would only be fair to the company and it would help to restore confidence in Indian industrial investments.

Electrical Switchgear & Associated Manufacturers, Ltd.—Metal Industries, Ltd., which is a large holder of British Oxygen ordinary has made an offer to acquire the whole of the issued 275,000 10s. ordinary shares of Electrical Switchgear & Associated Manufacturers, Ltd., on a cash and share basis. For every three 10s. ordinary shares of Electrical Switchgear, holders are offered one new £1 ordinary of British Oxygen, plus a cash payment of 3s. 9d. This will call for the allotment of 91,666 shares of the latter company. The shares to be allotted in exchange are part of the unissued shares of British Oxygen which is distributing a capitalised bonus of 20 per cent. to ordinary shareholders. Metal Industries holds £845,000 of British Oxygen ordinary shares and will therefore receive 169,000 of the new shares. When issued these shares will be converted into ordinary stock, and will rank equally with the existing ordinary of British Oxygen for the current year. The offer, which is conditional upon the acceptance by 80 per cent. of the holders, has been accepted by the directors of Electrical Switchgear, who recommend other holders to do the same. The offer is open until May 13th.

Johnson & Phillips, Ltd., report a profit for 1939 of £310,318, as compared with £205,639 for 1938. From this are deducted directors', auditors' and trustees' fees, £3,219; debenture interest, £17,230; reserved for sinking fund, £4,770; depreciation, £27,152; pensions, &c., £4,549; to taxation reserve, £42,500; and the additional items of £2,035, payments to men in the Forces, and £14,043 net loss on purchase and sale of machinery. The net balance is £194,820, an increase of £61,333, out of which £10,000 is placed to research and development account, £22,500 to dividend equalisation account, and £40,000 to contingencies reserve.

It is proposed to pay a final dividend of 7½ per cent., making 15 per cent. for the year (against 12½ per cent.), and to carry forward £106,454 (against £104,134).

The directors state in their report that they had proposed to recommend a final dividend of 10 per cent., making 17½ per cent. for the year, but in view of the statement of the Chancellor of the Exchequer they feel it their duty to recommend that the final dividend shall be limited to that paid last year.

The Oriental Telephone and Electric Co., Ltd., reports a net profit for 1939 of £113,881, as compared with £117,731. It is proposed to pay a final dividend on the ordinary shares of 7½ per cent. free of tax, making 11½ per cent. for the year. It was the intention of the board to pay a final dividend of 8 per cent., but in view of the Budget speech the directors have decided that the gross distribution may not exceed that of the standard year 1938.

The Marconi International Marine Communication Co., Ltd., reports a total revenue for 1939 of £483,022, as compared with £480.287 and a net profit of £99,918 (against £139,790). A sum of £6,755 is appropriated for depreciation of securities reserve and £4,000 is provided for E.P.T. or N.D.C. The final dividend is 5 per cent., making 7½ per cent. for the year, and £11.388 is carried forward (against £11,679 brought in). The total distribution for the previous year was 10 per cent., which included a bonus of 2½ per cent.

Hopkinsons, Ltd., report a trading profit for the year to January 31st of £222,631 as compared with £241,582 for 1938-39, to which is added other revenue, making a total income of £230.339 (against £248.165). The final ordinary dividend is 10 per cent., making 15 per cent., less tax, for the year (same). General reserve receives £50.000 and the balance carried forward is £44,090 (against £38,321 brought in).

The Western Union Telegraph Co. reports gross operating revenues for 1939 of $95,660,000, an increase of $3,948,000, as compared with 1938. After meeting all expenses, higher taxes, &c., there is a net income of $1,380,000, as against a deficit of $1,638,000. The accumulated surplus carried forward is $75,741,790 (against $74,433,000).

The West London and Provincial Electric and General Trust reports that the dividends, interest and other receipts for 1939, less tax and N.D.C., totalled £22,094, as compared with £26,103 for 1938, and the net revenue is £14,039 (against £17,635). The ordinary dividend for the year is 6 per cent. (against 6½ per cent.), and £3,849 is carried forward (against £5,765 brought in).

Walsall Conduits, Ltd., reports a net profit for 1939 of £162,092, as compared with £155,323 for 1938. Tax requires £72,128 and general reserve again receives £20,000. The final ordinary dividend is 35 per cent., making 55 per cent. for the year and the balance carried forward is £55,517, an increase of £8,714.

The East London Rubber Co., Ltd., reports a net profit for the year to February 29th of £50,120, as compared with £14,884 in the preceding year, to which is added £12,829 brought in. Tax reserve requires £18,000, general reserve £3,238, and staff fund £2,000. The ordinary dividend for the year is 5 per cent. (against 2½ per cent.) and £17,044 is carried forward.

The Ebonite Container Co., Ltd., reports a net profit for the year to February 29th of £13,565, after providing for income tax, N.D.C. and depreciation, as compared with £10,821 for 1938. The final dividend is 5 per cent. (same), plus a bonus of 6 per cent. (nil), making 14 per cent. for the year (against 8 per cent.), and £10,581 is carried forward (against £8,915 brought in).

The Kalgoorlie Electric Power & Lighting Corporation, Ltd., reports a profit for 1939 of £31,216, as compared with £30,997 for the preceding year. Tax requires £6,788 and depreciation £12,000. The total dividend is maintained at 7½ per cent. and £10,576 is carried forward (against £12,211 brought in).

The Weston-super-Mare and District Electric Supply Co., Ltd., reports a net revenue of £60,661 for 1939, as compared with £56,568 for 1938. The total ordinary dividend is unchanged at 10 per cent., tax free, and £7,895 is carried forward (against £9,210 brought in).

The Merthyr Electric Traction & Lighting Co., Ltd., reports a net revenue for 1939 of £29,820, as compared with £31,165 for 1938. The ordinary dividend for the year is maintained at 5 per cent., and £3,235 is carried forward.

Babcock & Wilcox, Ltd., report a profit of £756,663 for 1939 (after provision of £124.936 for war losses), as compared with £848,694 in the preceding year. It is proposed to pay a final dividend of 6 per cent., plus a cash bonus of 1 per cent., making 11 per cent., less tax, for the year. The total distribution for 1938 was 12½ per cent., which included a cash bonus of 2½ per cent.

The Lewes and District Electric Supply Co., Ltd., reports a net revenue for 1939 of £15,544, as compared with £17,845 for the previous year. The dividend for the year is maintained at 10 per cent. and £5,199 is carried forward (against £7,248).

The Sheerness & District Electric Supply Co., Ltd., reports a net revenue of £27,776 for 1939, as compared with £27,084 for 1938. The dividend for the year is 10 per cent. (same), and the balance carried forward is £5,805 (against £6,388 brought in).

The Birkdale District Electric Supply Co., Ltd., reports a net revenue for 1939 of £12,419, as against £14,161 for 1938. The dividend for the year is unchanged at 6 per cent., and £2.201 is carried forward (against £3,165 brought in).

Richard Johnson & Nephew, Ltd., are paying a first and final dividend of 9 per cent. for the year to March 31st (unchanged).

The Adelaide Electric Supply Co. is maintaining its interim dividend at 5 per cent.

The Associated Equipment Co., Ltd., has declared an interim dividend of 6d. per £1 unit of stock, free of tax (same).

The Eastern Telegraph Co. has announced a final dividend of 7½ per cent., making 11½ per cent. for the year (against 9½ per cent. for 1938).

STOCKS AND SHARES

TUESDAY EVENING.

THE strength of the Stock Exchange market in War Loan, Consols and other purely gilt-edged securities, stands out in marked contrast to the heaviness displayed in some of the other sections round the house. In days of uncertainly, it is always the purely gilt-edged stocks which receive the most attention and attract the greater part of that capital which is always accumulating and which has to be invested in some way or other. The Limitation of Dividends Bill may be published before the end of the week. Pending its publication, prices of ordinary stocks and shares have been rather inclined to give way. But fixed-interest and fixed-dividend securities command favourable attention. Business in all the Stock Exchange sections, with the single exception of the market for British Government securities, has suffered from restraint imposed by the war news and by uncertainty as to the operation of the limitation of dividend proposals.

Southern Railway Stocks

Limitation of wartime dividends applies to home railway stocks. So much, at least, is now quite certain as a result of the Chancellor's special statement on the subject. If the principle is plain, however, some details are not. The companies will evidently be allowed to pay up to 4 per cent. on their ordinary stocks. But the Southern Railway's ordinary capital, for instance, is divided between preferred and deferred stock. The former is entitled to a fixed non-cumulative 5 per cent. dividend, and no more. Consequently it has the qualifications of a prior charge. If it is so regarded, the deferred remains as the equity, and qualifies for the maximum dividend of 4 per cent., although, in point of fact, the Government scheme provides for maximum earnings of 3.2 per cent. But for the purposes of the Trustee Act, the two classes are lumped together as the ordinary capital, and calculations made accordingly. On which way the capital is regarded for present purposes, depend the chances of the preferred receiving the full 5 per cent. and the deferred a reasonable surplus of earnings. While the decision rests in the balance, the stocks concerned remain unsettled, the preferred at around 71 and the deferred at just under 20. Senior home railway stocks have derived cheer from the strength of the gilt-edged market.

Transport "C" Position

The chances of the London Passenger Transport Board being able to pay the standard 5½ per cent. dividend on the "C" stock seem to turn on whether the Board qualifies for special treatment as a statutory undertaking, as opposed to a public company; whether the "C" stock can properly be regarded as an "equity"; and, then, whether the dividend limitation can be applied. In the last event, the best standard the Board could claim would be 4¼ per cent., the rate paid for 1936-37. While awaiting the solution, the price of the stock remains in the doldrums at 44. An interim dividend of 1½ per cent. has been paid in respect of the year ending next month.

Price Changes

Quotations in the market for electricity supply shares remain virtually unmoved by events. A small advance in Northampton Electrics, to 43s. 3d., is among the few quotable changes. Electrical equipment shares present a firm front. So far as most of the leading shares are concerned, there is no evidence of dividend or bonus hopes having been at all seriously frustrated by the Chancellor. A fall of $\frac{1}{16}$ to 15s. in Hall Telephones can have little connection with that factor, the Company being among the few which have scope for raising the distribution should profits permit. Telephone Manufacturing, at 8s. 6d., are another dull spot in the telephone group, and Ericssons eased off to 33s. 9d. on the prospect that some change may be made in the tax-free rate of distribution, in order that the gross equivalent will not work out higher than in the standard years. Brush Electrical have been marked down from 4s. 6d. to 3s. 6d., and this may well reflect one instance of dividend hopes having been pitched above the maximum now allowed. Elsewhere, Laurence Scotts have again lost ground to 9s. 6d. British Aluminiums fell 3s. to 48s. 3d. Vickers are 9d. down at 17s. 3d. On the other hand, Revo Electrics are a firm feature at 17s. 6d., and Mather & Platts have recovered to 40s.

Johnson and Phillips Dividend

With their final dividend declaration, Johnson & Phillips have raised an intriguing point in connection with the Chancellor's new scheme for the limitation of dividends. The payment of 7½ per cent. now proposed is the same rate as was paid a year ago; but in the meantime the interim had been raised from 5 to 7½ per cent. The total for the year ended last December is thus 2½ per cent. more than the 12½ per cent. paid for 1938. Yet the latter was equal to the best distribution of the three pre-war years which, the Chancellor has ruled, has to be taken as the maximum standard for wartime dividends. The Company assumes that the Chancellor would not intend to interfere with an interim distribution made about six months ago. Some people hold, however, that the Company has taken a challenging decision which will require a special ruling. In discussion of the problem, reference has been made to the recent action of the Ford Company, which, having first announced an increased dividend, subsequently cut the distribution (before it was paid, of course) to conform with the pre-war standard. The analogy is not exact, since the factor of the increased interim payment is missing. Nevertheless the two decisions seem to be in conflict.

Whatever the rights or wrongs of the situation created by the Johnson & Phillips dividend decision, the shareholders have reason to feel rueful about the way in which the Budget has clipped their immediate dividend prospects. For, while they cannot feel altogether clear about whether even the 15 per cent. for the year will be allowed to stand, they are further tantalised to know that the directors had it in mind to bring the total up to 17½ per cent. On the hope of some such payment, buyers have lately been paying over 50s. for the shares. These are now a somewhat uncertain market at around 46s. 3d. At this figure, the yield on the 12½ per cent. standard dividend works out to £5 8s. 3d. per cent. Profits disclosed in the full report show that earnings are equal to double the rate of dividend declared on the ordinary capital.

Hard Cases

Disappointments, such as the above, arising out of the Budget, are likely to prove exceptional. This is the conclusion which most observers have reached after an interval for reflection on the new elements introduced by the Chancellor into the investment situation. Where serious anomaly seems to occur, there is a disposition to take it for granted that the harder the case, the more likely its chance of special consideration. Not that this has by any means dissipated every anxiety. British Electric Traction deferred stock, for instance, at 625, remains more than 100 points below the pre-Budget figure. Apparently debarred, unless special treatment is allowed, from either distributing the valuable scrip bonuses of recent years, or raising the comparatively negligible cash payments, the company's position is an extreme example. Throughout the price-lists of ordinary shares in every market, adjustments have been marked here and there to bring quotations into line with a "maximum" standard which falls below the last paid dividend; or which seems to rule out expectations of better payments to come. But the stability of the great majority of ordinary share-quotations reflects an attitude which will be satisfied enough to see wartime dividends maintained around the rates paid in the prosperous years of 1936-9.

Babcock and Wilcox Results

A fall of 2s. 9d. to 42s. 6d. ex dividend in the price of Babcock & Wilcox shares, followed the company's declaration of a final distribution, making 11 per cent. for the year, against 12½ per cent. previously. Dividends are the same as before, but the cash bonus is reduced from 2½ to 1 per cent. Responsibility for the decline in profits from £849,000 to £757,000 is more than accounted for by the amount of £125,000 written off war losses. Evidently it is overseas contracts which upset the previous expectations that active business in this country would enable the distribution to be kept up to 12½ per cent. The figures given in the preliminary statement are struck before provision for taxation. It is therefore supposed that the net earnings available for distribution will be shown to have fallen to a relatively greater extent. The last balance sheet exhibited a dividend equalisation fund of half-a-million pounds, and a general reserve of the same amount. Although lower than last year's, the 11 per cent. distribution is otherwise the best since 1931. Hopkinsons, the manufacturers of boiler mountings, valves, etc., and electrical devices, are bringing the distribution for the year up to 15 per cent. The final is reduced by the same amount, namely, 2½ per cent., as that by which the interim had previously been raised.

Miscellaneous Matters

The reduction in the distribution on Marconi International Marine shares from 10 to 7½ per cent. lowered the price 6d., to 25s., at which the shares offer a yield of 6 per cent. According to the preliminary figures, the net profit comes out at just under £100,000, which compares with last year's of nearly £140,000. On the evidence that any loss to the equity share, as a result of the dividend limitation, must prove to be the preference share's gain, the latter class of investments has continued to be in keen demand. The theory has been seen at work through the manner in which Cable and Wireless preference stock has lately left the ordinary standing. The latter remains a dull market at 55½, but the preference has put on 2½ points since the Budget, and is now within a point and a half of par. In another market, County of London 6 per cent. preference are among the few issues of the kind at present on offer in anything like bulk. The price is 28s. and the yield £4 5s. 9d. per cent. On the subject of stocks on offer, it is worth while to mention a line of Edmundsons' ordinary stock, which can be bought at 25s. 6d. to pay £4 14s. per cent. on the money, assuming the maintenance of the dividend at 6 per cent. Calcutta Electric 5 per cent. preference have settled down at about 26s. 3d. since the rejection of the proposal to curtail the right to tax-free dividends. Anglo-American Telegraph 6 per cent. preferred returned to favour on consideration of the £5 13s. 9d. per cent. yield in relation to the security, which rests on the rental paid to the company by Western Union. Now 105½, the price has put on 4 points in a fortnight. Brazilian Tractions have retreated to 9¾ on further evidence that Brazilian securities involve something more than the ordinary business risk.

ELECTRICAL COMPANIES' SHARES

Prices, Dividends and Yields

Company	1940 High-est	1940 Low-est	Dividend Pre-vious	Dividend Last	Price May 7	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies							
Bournemouth and Poole	63/6	57/–	15	15	61/3	—	4 17 10
British Power and Light	30/–	25/3	7	7	28/–	—	5 0 0
City of London	28/–	25/6	7½	7½	25/6	—	5 17 8
Clyde Valley	38/6	33/–	8	8	37/–	—	4 6 5
County of London	43/3	34/6	10½	10½	36/3	—	5 16 0
Edmundson's:							
7% Pref.	31/6	28/–	7	7	31/3	—	4 9 7
Ord.	27/6	21/9	9	6	25/–	—	4 16 0
Elec. Dis. Yorkshire	40/3	35/9	9	9	38/9	—	4 16 0
Elec. Fin. and Securities	41/3	40/–	12½	12½	41/3	—	6 1 0
Elec. Supply Corporation	46/3	41/–	12	11½	46/3	—	4 19 7
Isle of Thanet	16/–	15/–	4	4	15/–	—	5 6 8
Lancs Light and Power	33/–	28/6	7½	7½	31/3	—	4 16 0
Llanelly Elec.	21/–	19/6	5½	5½	21/–	—	5 4 9
Lond. Assoc. Electric	21/–	18/9	7	5½	20/–	—	5 10 0
London Electric	37/6	25/9	8	7½	25/9	—	5 12 8
London Power Deb. Red.	105½	103	5	5	104½	—	4 15 6
Metropolitan	41/6	36/–	12	10	36/3	—	5 10 4
Midland Counties	39/–	32/9	8	8	36/3	—	4 8 6
Mid. Elec. Power	40/–	36/–	8	9	38/9	—	4 13 0
Newcastle Elec.	29/9	26/–	7	7	27/6	—	5 1 10
North Eastern Electric:							
Ordinary	31/6	26/6	7	7	29/–	—	4 16 7
7% Pref.	32/6	30/–	7	7	31/6	—	4 9 0
Northampton	48/–	41/–	10	10	43/3	+9d.	4 12 6
Notting Hill 6% Pref. (£10)	10⅜	10	6	6	10⅜	—	—
Northmet Power:							
Ordinary	42/3	35/6	10	10	37/–	—	5 8 1
6% Pref.	29/–	26/9	6	6	28/–	—	4 5 9
Richmond Elec.	24/6	22/9	7	6	23/9	—	5 1 1
Scottish Power	38/–	31/9	8	8	35/9	—	4 9 6
Southern Areas	21/3	18/6	5	5	20/–	—	5 0 0
South London	23/3	22/–	7	7	22/6	—	6 4 3
West Devon	20/–	18/9	5	5	18/9	—	5 6 8
West Glos.	21/3	16/6	2	2½	21/3	—	2 10 0
Yorkshire Elec.	40/–	33/3	8	8	38/9	—	4 2 5
Overseas Electricity Companies							
Atlas Elec.	4/–	2/6	Nil	Nil	3/9	−3d.	—
Calcutta Elec.	37/–	30/–	10*	8*	32/6	−6d.	4 18 6
Cawnpore Elec.	30/–	28/6	10	10	28/9	—	6 19 2
East African Power	25/6	23/3	7	7	25/6	—	5 19 10
Jerusalem Elec.	24/–	21/6	7	7	24/–	—	5 16 8
Kalgoorlie (10/–)	12/6	9/6	7½	7	12/-xd.	−2d.	5 16 8
Madras	26/9	26/–	8*	8*	26/3	—	—
Montreal Power	35½	31	1½	1½	35	—	—
Palestine Elec. "A"	25/–	23/–	7½*	5*	23/9	—	4 4 3
Perak Hydro-electric	20/3	16/3	6	2½	16/3	—	3 1 6
Shawinigan Power	27½	20	83cts.	90cts.	24½	−½	—
Tokyo Elec. 6%	69	59½	6	6	62½	—	9 12 0
Victoria Falls Power	75/9	67/9	12½	15	75/–	—	4 0 0
Whitehall Investments Pref.	17/9	12/6	7½	7½	16/–	—	9 7 6
Public Boards							
Central Electricity:							
1950–70	110½	107	5	5	109	—	4 11 7
1955–75	112⅜	108½	5	5	111	—	4 10 0
1951–73	107⅛	103	4½	4½	107	—	4 4 0
1968–93	96½	90	3½	3½	94½	−1	3 14 1
London Elec. Trans Gtd.	92	87½	2½	2½	91	—	2 15 0
London & Home Counties							
1955–75	113½	106½	4½	4½	107	+½	4 4 1
Lond. Passenger Transport							
A	116	104	4½	4½	109½	—	4 2 0
B	116	103	5	5	109½	—	4 11 4
C	65½	42⅜	1½	—	44	—	—
West Midland Joint Elec., 1948–68	106½	105	5	5	106½	—	4 14 0
Telegraph and Telephone							
American Tel. & Tel.	215	205	9	9	212½	—	4 4 8
Anglo-Am. Tel.:							
Pref.	106	93½	6	6	105½	+2	5 13 9
Def.	23⅜	21	1½	1½	23	—	6 10 4
Anglo-Portuguese	22/6	19/9	8	8	22/6	—	7 2 6
Cable & Wireless:							
5½% Pref.	99⅜	94	4½	5½	98½	+½	5 11 8
Ord.	65	55	4	4	55½	−2	7 4 2
Income	99⅜	93	—	—	99½	—	4 0 5
Canadian Marconi $1	6/–	4/6	Nil	4cts.	5/6	—	—
Globe Tel. & Tel.							
Ord.	32/6	28/6	7½*	7½*	32/6	—	4 12 4
Pref.	28/9	24/6	6	6	27/6	—	4 7 3
Great Northern Tel. (£10)	20	12	20	20	14	—	14 5 8
Inter. Tel. & Tel.	5⅜	4½	Nil	Nil	4½	−⅛	—
Marconi-Marine	30/–	25/–	10	7½	25/-xd.	−6d.	6 0 0
Oriental Telephone Ord.	2⅞	56/–	12*	12*	2⅞	—	4 5 5
Telephone Props.	15/–	13/3	5	6	15/–	—	8 14 6
Telephone Rentals (5/–)	9/6	7/6	10	10	8/9	−3d.	5 14 3
Traction and Transport							
Anglo-Arg. Trams:							
First Pref. (£5)	4/3	3/3	Nil	Nil	4/–	—	—
4% Inc.	11½	7⅛	Nil	Nil	11½	—	—
British Electric Traction:							
Def. Ord.	830	600	5	5	625	—	—
Pref. Ord.	169	147	8	8	165	—	4 17 0
Bristol Trams	48/6	42/–	10	8*	43/9	−4/6	3 13 1
Brazil Traction	12⅛	9½	$1	50c.	9⅜	−1⅛	—
Calcutta Trams	24/–	22/6	8	8	23/6	—	6 16 2
Cape Elec. Trams	18/6	16/–	5	5	18/6	—	5 8 1
Lancs Transport	35/–	28/3	10	10	35/–	—	5 14 8
Mexican Light:							
1st Bonds	33	28	5	5	30½	—	—
Rio 5% Bonds	90	74	5	5	90	—	5 11 1
Southern Rly.:							
5% Prefd.	79	64	5	5	71	—	7 0 10
5% Pref.	104½	89⅜	5	5	100½	—	4 19 6
T. Tilling	45/9	36/9	10	10	42/–	—	4 15 3
Tilling & B.A.	47/6	43/9	9*	8*	47/6	—	3 7 10
West Riding	35/–	28/6	10	10	34/6	+1/6	5 16 0
Equipment and Manufacturing							
Aron Electricity Ord.	17/6	15/0	15	15	17/6	—	—
Assoc. Elec.:							
Ord.	43/3	37/9	10	10	40/–	—	5 0 0
Pref.	35/3	32/3	8	8	35/–	—	4 11 5
Automatic Telephone & El.	47/3	42/–	12½	12½	45/–	—	5 11 1
Babcock & Wilcox	50/–	42/–	10	11	2½xd.	−2/9	5 3 6
British Aluminium Ord.	56/–	48/3	12½	12½	48/3	−3/–	5 3 9
British Insulated Ord.	92/6	78/9	20	20	88/9	—	4 10 1
British Thermostat (5/–)	14/9	11/9	18½	18½	13/3	—	6 19 7
British Vacuum Cleaner (5/–)	12/6	8/6	40	12½	12/6	—	5 0 0
Brush Ord.	4/6	3/–	Nil	Nil	3/6	−1/–	—
Callender's	69/–	59/6	20	15	63/9	—	4 14 4
Chloride Elec. Storage	72/6	68/–	20	15	3⅜	—	4 2 9
Consolidated Signal	72/6	59/–	36½	17	3⅜	—	4 13 10
Crabtree (10/–)	24/9	21/–	17½	17½	23/9	—	7 7 4
Crompton Parkinson:							
Ord. (5/–)	20/–	17/–	15	20	17/6	—	5 14 3
E. K. Cole (5/–)	5/–	3/3	10	Nil	4/–	—	—
Elec. & Musical Industries (10/–)	10/3	7/9	5	Nil	9/–	−3d.	—
Electric Construction	36/3	32/6	12½	13½	36/3	—	7 9 2
Enfield Cable Ord.	56/–	46/3	25	16½	52/6	—	6 3 6
Electrical Switchgear (10/–)	22/6	20/–	16	10	21/3	—	4 14 3
English Electric	33/9	29/6	10	10	31/3	—	6 8 0
Ensign Lamps (5/–)	15/3	13/9	25	25	13/9	—	9 1 10
Ericsson Tel. (5/–)	39/3	33/9	25*	25*	33/9	−1/8	3 14 1
Ever Ready (5/–)	28/3	26/–	30	40	26/6xd.	—	7 11 0
Falk Stadelmann	18/3	17/6	10	6	17/6	—	6 17 4
Ferranti Pref.	25/–	23/–	7	7	25/–	—	5 12 0
G.E.C.:							
Pref.	32/6	28/–	6½	6½	32/–	—	4 1 3
Ord.	83/3	74/3	17½	20	80/–	—	5 0 0
Greenwood & Batley	25/6	16/–	15	10	25/–	—	12 0 0
Hall Telephone (10/–)	18/6	15/–	15	10	15/–	−1/8	6 13 4
Henley's (5/–)	21/6	17/9	20	20	18/9	−1/8	5 6 8
4½% Pref.	21/3	20/6	4½	4½	21/3	—	4 4 8
Hopkinsons	46/9	42/6	12½	15	43/9xd.	—	6 17 0
India-Rubber Pref.	21/–	20/3	5½	5½	20/9	—	5 6 0
Intl. Combustion	121/3	110/–	32½	32½	5½	—	5 13 0
J. Lucas	60/6	53/3	15	15	57/6	—	5 4 5
Johnson & Phillips	50/9	42/3	12½	15	46/3xd.	−1/6	5 8 3
Lancashire Dynamo	59/9	53/–	25	20	55/–	—	7 5 6
Laurence Scott (5/–)	11/–	9/3	15	15	9/6	−6d.	7 17 10
London Elec. Wire	25/6	25/–	12	7½	25/–	—	6 0 0
Mather & Platt	46/6	36/3	13½	10	40/–	+1/8	5 0 0
Metropolitan Elec. Cable Pf.	22/–	21/3	5½	5½	21/3	—	5 3 6
Murex	86/9	77/6	20	20	78/9	−1/8	5 1 6
Pye Deferred (5/–)	9/–	7/–	25	25	9/–	+3d.	13 17 9
Revo (10/–)	20/9	16/3	17½	17½	17/6	+1/8	10 0 0
Reyrolle	60/6	56/3	12½	12½	57/6	—	4 7 0
Siemens Ord.	23/9	19/6	7½	7½	22/6	—	6 13 4
Strand Elec. (5/–)	2/3	1/9	10	4	2/–	—	8 0 0
S. Smith (1/–)	8/–	7/–	37½	50	7/6	—	6 13 4
Switchgear & Cowans (5/–)	11/9	7/6	20	10	10/–	—	5 5 3
Telegraph Condenser (10/–)	8/9	6/3	5	—	8/9	—	—
Telegraph Construction	42/6	32/6	10	10	37/6	—	5 6 8
Telephone Mfg. (5/–)	9/–	7/9	9	9	8/6	−6d.	5 6 0
Tube Investments	96/9	87/9	23⅜	23⅜	93/9xd.	+1/8	5 2 6
Vactric (5/–)	3/6	2/–	4	Nil	3/3	—	—
Vickers (10/–)	22/–	16/6	10	10	17/3	−9d.	5 16 0
Ward & Goldstone (5/–)	19/9	19/3	20	20	19/9	—	5 1 3
Westinghouse Brake	46/–	32/9	17½	10	45/–	—	4 9 1
Walsall Conduits (4/–)	26/6	23/9	55	55	26/3	—	8 7 8
West, Allen (5/–)	7/–	5/–	10	7½	5/6	—	5 15 3

* Dividends are paid free of Income Tax.

CONTRACT INFORMATION

Particulars of work for which tenders are invited, contracts placed, and building schemes promising work for electrical contractors and traders

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses. Further details of items marked with an asterisk can be obtained from the Department of Overseas Trade (Inquiry Room), Great George Street, London, S.W.1.

Barking.—May 14th. Borough Council. Modified street-lighting fittings. Borough electrical engineer, Electricity Department, Ripple Road (deposit £1 1s.).

Bournemouth.—May 14th. Town Council. Replacement of the existing electrical fittings in the Pavilion Concert Hall. General manager of Hall.

Bristol.—May 21st. Corporation. X-ray equipment for Southmead Hospital. (April 26th.)

May 14th. Electricity Department. E.h.v. switchgear, l.v. substation switchgear and transformers. (May 3rd.)

Cardiff.—May 20th. Electricity Department. Two 1,000-kVA and four 500-kVA transformers. (May 3rd.)

Eire.—May 21st. Offaly County Board of Health. Electrically operated pumping machinery for the Edenderry sewerage scheme, comprising two automatic centrifugal pumps with float gear, switches and star-delta starters, and one horizontal type pump directly connected to an electric motor. Nicholas O'Dwyer, consulting engineer, 6, Burlington Road, Dublin (deposit £2 2s.).

Glasgow.—May 13th. Electricity Department. Meters, cable covering tiles and insulating tapes for one year. (April 26th.)

Isle of Wight.—May 28th. County Council. Electrical installation at Whippingham school. S. Gregson, county architect, Newport (deposit £1 1s.).

India.—NEW DELHI.—May 21st. Stores Department. Dust extraction, air cooling and ventilation plants. (T. 19085/40.)*

Macclesfield.—June 13th. Electricity Department. E.h.v. and l.v. cables. (See this issue.)

New Zealand. — WELLINGTON. — May 27th. Posts and Telegraph Department. Six 5-kVA Diesel engine driven generators. (T. 18693/40.)*

May 28th. Textile-covered lead-sheathed telephone cables. (T. 18695/40.)*

June 20th. 1,800 lb. of insulating and sealing compound. (T. 19165/40.)*

June 25th. Public Works Department. One 11-kV outdoor-type oil-immersed circuit-breaker. (T.Y. 18700/40.)*

July 9th. Three 4,500-kVA voltage regulating transformers. (T. 19163/40.)* One 4,500-kVA voltage regulating transformer. (T. 19162/40.)*

July 16th. Equipment for the remote control of switchgear and transformers at Mt. Roskill substation from Penrose substation. (T. 19161/40.)*

Reigate.—May 15th. Cleansing Department. One 44-kW mercury arc rectifier. (May 3rd.)

Sheffield.—May 15th. Electricity Department. Two steam shunting locomotives. (April 26th.)

June 5th. Two 15,000-kVA transformers. (See this issue.)

South Africa.—CAPE PROVINCE. — May 29th. Municipality of Upington. Electrically driven pumps. (T. 18756/40.)*

PRETORIA.—May 23rd. Union Tender and Supplies Board. Magnet and p.b.x. switchboards, relay set, mounting plates and shelves. (T. 18813/40.)*

May 30th. Laundry machinery for the Bloemfontein Mental Hospital. (T. 18811/40.)*

Surbiton.—May 11th. Borough Council. Twelve months' supply of electric lamps and fittings. Borough engineer, Council Offices.

Orders Placed

Aberdeen.—Streets and Works Department. Accepted. Electrical fittings for three months.—Lawson, Turnbull and Co.

Abingdon.—Joint Hospital Board. Accepted. Electrical installation work at the Isolation Hospital (£107).—Hill Upton & Co.

Australia.—COMMONWEALTH. — P.M.G.'s Department. Accepted. Switchboard keys (£403).—Ericsson Telephone Manufacturing Co. Wireless receivers (£239).—Standard Telephones & Cables Pty., Ltd.

SYDNEY.—County Council Electricity Undertaking. Accepted. 33-kV cable for Bunnerong power station (£1,514).—Johnson & Phillips.

VICTORIA.—Victorian Railways. Accepted. Telephone cable (£181 per mile).—B.I. Cables. 6,600-V cable (£431 per mile).—Siemens (Aust.) Pty., Ltd.

Bournemouth. — Town Council. Accepted. Lifts for the Sanatorium at Linford, near Ringwood.—Marryat & Scott.

Durham.—County Council. Accepted. Electrical installation at the Central Depôt, Framwellgate Moor Colliery (£269).—Cox Walkers.

Bradford.—Electricity Committee. Recommended. Coal-grab chain. — T. Smith & Sons (Rodley). Boiler ductwork.—Frederick Fox. Circulating water pipes for turbine.—Staveley Coal & Iron Co.

Education Committee. Recommended. Diesel engine for Technical College (£2,330).—English Electric Co.

Cardiff.—Electricity Committee. Accepted. Two cooling towers at Roath power station (£93,164).—Concrete Piling Co.

Huddersfield.—Electricity Department. Accepted. Three 500-kW and three 300-kW transformers.—Met.-Vick. Elecl. Co.

Leeds.—Electricity Committee. Accepted. Cables (£1,474). — Aberdare Cables.

Transport Committee. Accepted. Cable (£503).—Henley's. Cable, &c. (£261).—B.I. Cables. Trolley wire (£1,188).—T. Bolton & Sons.

Manchester. — Transport Committee. Accepted. Supplies for twelve months to March 31st, 1941: Oil resisting cables (single and twin) and composition insulated bolts.—B.I. Cables. Controller components.—B.T.H. and Controller Contacts (Cardiff). Porcelain insulators, &c., malleable iron clevices, bolts, &c. (for overhead line equipment), solenoid coils for point controllers and two-way connectors.—Forest City Electric Co. Cable (660-V and 250-V).—W. T. Glover & Co. Twin bell wire and asbestos covered cable.—Henley's. Low- and high-voltage cable and brass armoured cable.—Ripaults.

Newcastle-on-Tyne.—City Council. Accepted. Automatic electric cabinet refrigerator at the City Mental Hospital (£130).—G.E.C.

Northampton.—Water Committee. Accepted. Venturi meter and recording gear (£265).—Electroflo Meters.

Northumberland.—County Council. Accepted. Battery plates, &c., for the Mental Hospital (£145).—Tudor Accumulator Co.

Rotherham. — Electricity Committee. Recommended. Supplies for twelve months: Transformers.—G.E.C. Boxes and covers.—Hattersley Bros.

Transport Committee. Recommended. Eight trolley-vehicle chassis.—Sunbeam Commercial Vehicles.

Sheffield. — Health Committee. Accepted. Dustless refuse collecting vehicle (£1,980).—Electricars. Three electrically driven centrifugal pumps for sewage works (£408).—Adam's Hydraulics.

Transport Committee. Accepted. Contracts renewed for twelve months: Lamps.—J. Riley & Sons. Lamps and cable.—R. Neill & Co. (Sheffield). Copper tips.—H. Peace. Armature coils, commutators and copper rings.—P. R. Jackson & Co. Copper contacts.—T. Bolton & Sons.

Wallasey.—Hospital Committee. Accepted. Electrical work at Mill Lane Hospital (£119).—F. H. Ashworth.

Wimbledon. — Electricity Committee. Accepted. Cables.—Britannic Electric Cable & Construction Co.

Sewerage Committee. Accepted. Pump and electric motor for Durnsford Road pumping station (£456). — Gwynnes Pumps.

TRADE MARK APPLICATIONS

AMONG recent applications for British trade marks are the following, objections against any of which may be entered within one month from April 24th:—

Sunbeam (lettering and design). No. 604648. Class 9 (IV). Electric flat irons.—Chicago Flexible Shaft Co., 5,600, Roosevelt Road, Chicago, U.S.A. (British representatives, Frank B. Dehn & Co., Kingsway House, 103, Kingsway, W.C.2.)

Radiotron. No. 608499. Class 9 (IV). Electrical vacuum tubes and thermionic valves.—R.C.A. Manufacturing Co., Inc., Camden, New Jersey, U.S.A. (British representatives, Stevens, Langner, Parry & Rollinson, 5-9, Quality Court, Chancery Lane, W.C.2.)

Aurora. No. 610842. Class 9 (IV). Electric batteries.—Beautex, Ltd., Station Approach, Waltham Cross, Herts.

Rexobat. No. 610862. Class 9 (IV). Electric batteries.—Isaac Scher, 60, Myrdle Street, London, E.1.

May 1st

Pigeplas. No. 610514. Class 9 (IV). Insulated electric conductors or cables. No. 610601. Class 17 (IV). Pigelan. Nos. 610515 and 610602. Classes 9 and 17 (IV), and Teleplas. Nos. 610599 and 610600. Classes 9 and 17 (IV). Electrical insulating materials.—Pirelli-General Cable Works, Ltd., 343-345, Euston Road, N.W.1.

Mullard. No. 602429. Class 9 (IV). Electron discharge tubes and cathode rays (none being for surgical or curative purposes). Wireless telegraphic and telephonic receiving instruments and apparatus, radio gramophones, television apparatus, cathode ray tube oscillographs, testing and measuring instruments and apparatus embodying electron discharge devices; alternating current bridges for measuring resistance, capacity and inductance; signal generators for use in the testing and adjusting of wireless receiving television apparatus and component parts of the aforesaid goods.—Mullard Wireless Service Co., Ltd., Spencer House, South Place, Finsbury, E.C.2.

Leesona. No. 610588. Class 9 (IV). Electrical coils.—Universal Winding Co., Cranston, Rhode Island, U.S.A. (British representatives: Boult, Wade & Tennant, 112, Hatton Garden, E.C.1).

Heatrae. No. 610712. Class 9 (IV). Electric kettles, urns, cooking pots and pans. No. 611048. Class 11 (IV). Electric wash boilers.—Heatrae, Ltd., St. Georges Street, Norwich.

Thyrect. No. 610964. Class 9 (IV). Mercury vapour rectifiers. — British Thomson-Houston Co., Ltd., Crown House, Aldwych, W.C.2.

Megalux. No. 610260. Class 11 (IV). Electric lamps, bulbs, globes, shades, reflectors, and torches.—Megalux Co. Ltd., 199, Old Street, E.C.1.

Flurolette. No. 610643, also Streamolier. No. 610644. Class 11 (IV). Lighting fittings.—Benjamin Electric, Ltd., Tariff Road, Tottenham, N.17.

Slickette. No. 610944. Class 11 (IV). Electric torches.—J. A. Luke, Ltd., 15, Seething Lane, E.C.3.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ashington (NORTHUMBERLAND). — Pithead baths for the Miners' Welfare Committee; Gibson Brothers, builders, Hill Heads, Whitley Bay.

Bakery for Thomas Proudlock, Ltd.; R. Carse & Son, builders, Oldgate, Morpeth.

Bangor. — Students' accommodation, University College of North Wales; W. Moss & Sons, Ltd., Roscoe Street, Liverpool.

Barking.—Extensions to factory for Holmes Marine Life Protection Association, Shell-Mex House, London, W.C.2.

Barnstaple. — Rebuilding Holywell School, Tavistock; R.D.C. surveyor.

Bedworth. — Houses (£30,238), for U.D.C.; Surveyor's Department, Newtown Road.

Birkenhead.—Completion of tenements, Helmington Road (£17,635); borough engineer.

Boreham Wood.—Factories, Warwick Road; John Laing & Co., Ltd., contractors, Bunn's Lane, Mill Hill, N.W.7.

Bournemouth.—Church, Poole Lane; Trevanion & Curtis.

Bristol.—Staff quarters (£22,750), Eastville Institution, for P.A.C.; City Engineer's Department, Queen Street.

Cardiff.—Business premises, Newport Road, Rumney; C.W.S., Ltd.

Chester - le - Street. — Sewage works (£14,000); R.D.C. surveyor.

Cornwall. — Senior school, Penryn (£8,000), for E.C.; county architect, County Hall, Truro.

Coventry.—Shops, Church Lane and Walsgrave Road, for Healey & Baker, King Edward House, New Street, Birmingham.

Civic centre fronting Earl Street and Jordan Well; D. E. Gibson, city architect.

Eccles.—Extensions to open-air school (£6,578); Education Committee.

Eton.—Fire station (£2,500), Iver, for R.D.C.; surveyor, Denmark House, Windsor Road, Slough.

Folkestone.—Public abattoir; borough engineer.

Gateshead.—Extensions to pithead baths at the Ravensworth Betty and Ann Pits for the Miners' Welfare Committee; D. & J. Ranken, Ltd., builders, Stockton Road, Sunderland.

Gravesend.—Licensed premises, 44-5, New Road; Truman, Hanbury, Buxton & Co., Ltd.

Haverfordwest.—Houses at Camrose and Solva, for R.D.C.; surveyor, Council Offices.

Hereford. — Waterworks (£22,750); Major A. H. S. Waters, consulting engineer.

Hetton.—Hotel for J. W. Cameron and Co., Ltd., West Hartlepool; R. W. Bell & Co. (Builders), Ltd., 4, Grantham Road, Newcastle-on-Tyne.

Hinckley.—Extensions of works, Southfield Road, for Bennett Bros. (Hosiery Manufacturers and Dyers), Ltd., Southfield Road; Bowles & Son, contractors, 8, Gladstone Street, Leicester.

Hitchin.—Highways depôt and stores block, Bury Mead Road, for U.D.C.; A. King, acting surveyor, Old Town Hall, Hitchin.

Keighley.—Boiler house, Fever Hospital, Riddlesden; Hospital Board.

Lancaster.—Factory for Storey Bros. & Co., White Cross Mills; E. Middleton, architect, 46, King Street, Lancaster.

Lincoln.—Factory at Metheringham Farm, Nocton, for Lincolnshire Flax Co.; P. V. Burnett, architect, 107, Jermyn Street, London, S.W.1.

Liverpool.—Additions and alterations to works for Merseyside Food Products, Ltd., Marsh Lane, Bootle; A. Neville Holt, architect, 43, Imperial Buildings, Exchange Street East.

Mansfield.—Houses, Sylvester Street, for A. Mason, Ltd., builder, Sutton Road.

Millom. — Branch tannery, Millom Road, for West Coast Chrome Tanning Co., Ltd., Millom.

Murton.—Bakeries, Bridle Lane; S. E. Durham, Co-operative Bakeries, Ltd.

Newcastle-on-Tyne.—Additional shelters at schools, &c.; Davison, Eason & Harkness, New Mills, Barrack Road; J. T. Main, builder, Elswick Road; J. & W. Lowry, Corporation Street; Elliott Bros., Otterburn Terrace; and Sowerbys (Contractors), Ltd., 26, Ridley Place.

Newcastle-under-Lyme.—Additions to Enderley Mills; John Hammond & Co.

Northampton.—Boot factory additions, Craven Street; Church & Co., Ltd.

Northumberland.—Public shelters at Ashington and Bedlington (£8,709), and shelters at 19 schools for the C.C.; county architect, Mitford Road, Morpeth.

Oakham (RUTLAND).—Cinema, High Street; Mr. Black, proprietor of Regal Cinema, Oakham.

Sheffield.—Hardening shop, for Hadfields, Ltd., Newhall Road, Attercliffe, Sheffield, 9.

Workshops and store, Owlerton Green, for W. R. Swann & Co., Ltd., Penn Works, Bradfield Road, Owlerton, Sheffield.

Additional workshops and canteen, Archer Road, for Laycock Engineering Co., Ltd., Archer Road, Beauchief, Sheffield.

Workshop and warehouse, Rockingham Street, for M. Bernard & Co.

Factory and stores, Hunter Road, for A. L. Simpkin & Co., Ltd., Hunter Road, Sheffield, 6.

Works additions, Dixon Street, for George Clark (Sheffield), Ltd., Penistone Road, Sheffield, 6.

Workshops and offices, Carwood Road, for Thos. Firth and John Brown, Ltd., Sheffield, 4.

Offices and pattern shop, Carbrook Street, for Beeley Foundry Co., Ltd.

Workshop and store, Edward Street; D. O'Neill & Son, builders, Solly St., Sheffield, 1.

Shops and flats, Southey Hill; Davies & Parkin.

Southport.—Senior department, Lady of Lourdes School; R.C. trustees.

South Shields.—Three shops, Little Horsley housing estate (£1,800); A. G. Richardson, borough engineer, Town Hall.

Public shelters for the T.C. (£6,300); borough engineer.

Staffordshire.—Machine shop at Dudley and Staffordshire Technical College (£6,625); G. C. Lowbridge, county architect, Council Offices, Stafford.

Stoke-on-Trent.—Additions to works for Michelin Tyre Co., Ltd., Boothen Estate.

Houses on Newhouse Farm Estate, Bucknall, and at Meir; J. R. Piggott, chief architect, Town Hall.

Sunderland.—Additions to factory in St. Mark's Terrace for the Trebon Manufacturing Co.; Matkin & Hawkins, architects, Barclay's Bank Chambers, Fawcett Street, Sunderland.

Galvanising shop in New Pallion Road, for National Galvanisers, Ltd.; staff architect.

Premises in Tatham Street and substation, Back Roker Avenue; J. Rutherford, Northern Rediffusion Co., Blackett Street, Newcastle.

Tunstall.—Kiln and warehouse, for A. Meakin (Tunstall), Ltd., Newfield Pottery, Tunstall.

Warrington.—Junior technical school for boys and junior commercial school for girls; J. Y. Hughes, borough surveyor, Town Hall.

West Ham.—Factory, Romford Road, for R. G. Harbott & Co., 242, Sebert Road, London, E.7; H. G. Needham & Son, architect, 139, Earlham Grove, Forest Gate, London, E.

Factory, 100, Carpenters Road, E.15; Ley, Colbeck & Partners, architects, Palmerston House, Bishopsgate, London, E.C.2.

Wolverhampton. — Hotel, Fairview Farm estate, Wednesfield, for Holt Brewery Co., Ltd., Holt Street, Birmingham; O. M. Weller, staff architect.

York.—Houses and flats, Little Willow Street, city engineer.

Tasmanian Commission's Silver Jubilee

IN October, 1914, the Tasmanian Government took over the electricity works of the Hydro-electric Power and Metallurgical Co., Ltd., and last year, on the twenty-fifth anniversary of that occasion, a bronze tablet was erected in the new offices of the Hydro-electric Commission. From a humble beginning with 10,000 HP of plant at Waddamana and one transmission line to Hobart the system has, in a quarter of a century, been developed until it now comprises three power stations with a total installed capacity of 143,000 HP and transmission lines reaching to all parts of the State.

In 1938-39 the total quantity of electricity sold was 467 million kWh, an increase of 11 per cent. over the previous year. Electric cooking and water heating continued to grow in popularity and in the Hobart district the number of ranges connected increased by 322 to 2,300 and water heaters by 289 to 2,480. There are now 1,392 all-electric homes in the neighbourhood of the capital.

The Commission's country district service dates back fifteen years, and there are now 15,630 consumers compared with 279 at the end of the first year. The network of high-voltage lines has been extended from 36 miles to 1,029 miles and low-voltage lines from 10 to 547 miles. At the close of the period under review there were 1,260 electric ranges in use in country areas. To enable residential consumers to make greater use of electricity for lighting a two-part tariff was introduced under which all consumption in excess of 7 kWh per assessable room is charged at the domestic power rates, and this proved extremely popular. Sales in the country districts during 1938-39 totalled 57.7 million kWh compared with 32.7 million kWh in the previous year, an increase of 77 per cent.

The very low average revenue per kWh sold was further slightly reduced during the year, from 0.284d. to 0.283d. Total revenue was £551,262, an improvement of 11 per cent., and the net profit amounted to £5,744 against £3,583 a year before.

Electricity Frauds

SENTENCES of a month's hard labour were passed on two men at Birkenhead Police Court on April 26th for fraudulently consuming electricity by "bridging the wires." At the same Court fines varying from £2 to £6 were imposed on eleven other defendants. The deputy town clerk said that during the past year the Corporation had prosecuted 48 people for this offence.

On May 1st a further series of summonses were heard, four defendants being fined £10 each and ten £6. On May 3rd five were fined £6 each.

Coming Events

May 16th (Thursday).

I.E.E. (*Irish Centre*).—Trinity College, Dublin. 6 p.m. Annual general meeting.

May 17th (Friday).

Faraday Society.—The Royal School of Mines, Imperial College of Science, S. Kensington. 2.30 p.m. General discussion on "The Hydrogen Bond." 7.15 p.m. Rembrandt Hotel, S.W.7. Informal dinner.

May 21st (Tuesday).

I.E.E. (*North Ireland Sub-Centre*).—9, Wellington Place, Belfast. 6 p.m. Annual general meeting.

May 22nd (Wednesday).

Electrical Association for Women (*London Branch*).—20, Regent Street, S.W.1. 2.30 p.m. "How Electricity Contributes to Safe Railway Working." By T. S. Lascelles.

May 28th (Tuesday).

Institution of Civil Engineers.—Great George Street, S.W.1. 5.30 p.m. The James Forrest Lecture by E. V. Appleton.

May 30th (Thursday).

British Institute of Radiology (*The Röntgen Society*).—Reid-Knox Hall, London. 2.30 to 4.30 p.m. Papers on "Physical and Biological Experiments with Neutrons." 6.30 p.m. Annual general meeting.